**Making Sense of Environmental Governance: A Study of E-waste in Malaysia**

**Tengku Adeline Adura Tengku Hamzah**

## ABSTRACT

The nature of e-waste, which is environmentally disastrous but economically precious, calls for close policy attention at all levels of society, and between state and non-state actors. This thesis investigates the roles of state and non-state actors in e-waste governance in Malaysia. This is undertaken through analysis of e-waste governance, particularly focusing on the locally generated industrial and household e-waste, from the perspective of multiple actors, levels and modes of governance.

From the perspective of multiple actors governance, this thesis recognises three main actors of e-waste governance in Malaysia – the state actor, and two types of non-state actors – the Private Sector Actors and the Civil Society Organisations. Although it appears theoretically simple to classify actors of governance into one of these categories, in practice the line separating these two categories is blurry.

From the multiple modes perspective, empirical evidence from this research has shown that state and non-state actors are involved in four modes of governance – the hierarchical, persuasion, self-governance and co-governance mode; with the roles of state actors being more prominent in the hierarchical modes, while the roles of non-state actors are more significant in the persuasion, self-governance and co-governance modes. State and non-state actors are jointly involved in one variant of co-governance which is the public-private partnership (PPP). Although the inclusion of non-state actors in governance is usually on 'acutely constrained terms' (Murdoch and Abram 1998: 49), they may influence the process of decision making.

From the perspective of multi level governance, it is apparent that power and authority in e-waste governance transcend beyond the boundary of sovereign states with the introduction of supra-national legislation such as the Basel Convention, WEEE directive and RoHS directive. This has direct implication on Malaysia as she is a party to Basel Convention, and produces electrical and electronic equipment for global market.

# MAKING SENSE OF ENVIRONMENTAL GOVERNANCE: A STUDY OF E-WASTE IN MALAYSIA

**BY**
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# Abbreviations

| | | |
|---|---|---|
| ARF | : | Advanced Recycling Fee |
| BAN | : | Basel Action Network |
| BRF | : | Brominated flame retardants |
| CAP | : | Consumer Association of Penang |
| CBO | : | Community-based Organisation |
| CCM | : | Companies Commission of Malaysia |
| CEH | : | Centre for Environmental Health |
| CPA | : | Clean Production Action |
| CRT | : | Cathode Ray Tube |
| CSO | : | Civil Society Organisation |
| CSR | : | Corporate Social Responsibility |
| CTBC | : | Computer Take-Back Campaign |
| DOE | : | Department of Environment |
| EEB | : | Environment Bureau |
| EEE | : | Electrical and Electronic Equipment |
| EPA | : | Environmental Protection Agency |
| EPR | : | Extended Producers Responsibility |
| EQA | : | Environmental Quality Act |
| ESM | : | Environmentally Sound Manner |
| ETBC | : | Electronic Take Back Campaign |
| EU | : | European Union |
| FOMCA | : | Federation of Malaysian Consumers' Association |
| GLC | : | Government-linked Company |
| GONGO | : | Government Organised NGO |
| IC | : | Integrated circuit |
| ICT | : | Information and Communication Technology |
| LA 21 | : | Local Agenda 21 |
| MBPJ | : | *Majlis Bandaraya Petaling Jaya* (Petaling Jaya Town Council) |
| MEA | : | Multi-lateral Environmental Agreement |
| MENGO | : | Malaysian Environmental NGO |
| MIDA | : | Malaysia Industrial Development Authority |
| MNC | : | Multi-national Corporation |
| MPPP | : | *Majlis Perbandaran Pulau Pinang* (Penang Island Municipal Council) |
| MPSP | : | *Majlis Perbandaran Seberang Prai* (Seberang Prai Municipal Council) |
| MPS | : | *Majlis Perbandaran Seremban* (Seremban Municipal Council) |
| MSC | : | Multi-media Super Corridor |
| NGO | : | Non-governmental Organisation |
| OECD | : | Organisation for Economic Co-operation and Development |
| PBB | : | Polybrominated Biphenyls |

| | | |
|---|---|---|
| PBDE | : | Polybrominated Diphenyl Ethers |
| PCB | : | Polychlorinated Biphenyls |
| PEWOG | : | Penang Environmental Working Group |
| PIKOM | : | *Persatuan Industri Komputer Malaysia* (National ICT Association of Malaysia) |
| PLGCF | : | Penang Local Government Consultative Forum |
| PJ | : | Petaling Jaya |
| PPP | : | Public-private Partnership |
| PSA | : | Private Sector Actor |
| QUANGO | : | Quasi NGO |
| RA | : | Residents' Association |
| RT | : | *Rukun Tetangga* (Neighbourhood Watch) |
| RoHS | : | Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment |
| ROS | : | Registrar of Societies |
| SAM | : | *Sahabat Alam Malaysia* (Friends of the Earth Malaysia) |
| SEA | : | South East Asia |
| SERI | : | Socio-Economic and Environment Research Institute |
| SVTC | : | Silicon Valley Toxics Coalition (SVTC), |
| UN | : | United Nation |
| UNEP | : | United Nation Environmental Programme |
| UNDP | : | United Nation Development Programme |
| UK | : | United Kingdom |
| USA | : | United States of America |
| WEEE | : | Waste Electrical and Electronic Equipment |

## STATEMENT OF COPYRIGHT

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# DEDICATION

*For Rohizi*

# Chapter 1: Introduction

## 1.1 E-waste: An Introduction

One of the consequences of life is the generation of waste. In today's modern life, the generation of a new type of waste - the waste of electrical and electronic equipment or e-waste - is growing exponentially due to the increasing penetration of electrical and electronic devices into every aspect of modern lifestyle. It is estimated that the world's production of e-waste is about 40 million tonnes per year (UNEP 2010, Schluep et al. 2009). E-waste is said to be the fastest growing waste stream in the world (Nnorom and Osibanjo 2008, Jain 2008, Cui and Forssberg 2003), with the growth rate at 3% to 5% per year (Secretariat of the Basel Convention 2005 in Mohan et al. 2008), which is three times faster than the general waste (Pucket et al. 2002), thus creating a great management challenge to most countries worldwide.

Managing e-waste is a challenging task, not only due to its rapidly increasing volume, but more importantly because of its hazardous nature. E-waste contains numerous hazardous substances which may pose a threat to the environment and human health if they are not disposed of in the correct manner. On average, 9% of the weight of e-waste is made of hazardous substances such as lead, cadmium, mercury (heavy metals) and other toxic chemicals (Umweltbundesamt 2006, in Sarkar 2008). For example, beryllium is used to make computer motherboards, cadmium in semiconductors, and lead is found in computer monitors as well as batteries. A desk top computer with a 15-inch CRT (cathode ray tube) monitor has an average mass of 25 kg (Robinson 2009), may contain as much as five pounds (about 2.3 kg) of lead (Pinto 2005). Due to its hazardous nature, e-waste needs to be disposed of in an environmentally sound manner. However, several factors such as lack of information on how to dispose e-waste properly, lack of facilities for proper

disposal, and the absence of effective regulation mean that e-waste is frequently discarded together with normal household waste.

Once in the household waste stream, e-waste may be disposed of in landfill or through incineration. The presence of e-waste in landfill may bring disastrous environmental impacts. This is because the hazardous substances in e-waste may leach into watercourses, causing contamination of soil and water and associated health risks. Even a small amount of e-waste entering landfill sites can contain a relatively high amount of heavy metals and halogenated substances (Janz and Bilitewski 2008) due to the high concentration of the materials. A research study by NGOs in the United States of America (USA), such as Basel Action Network (BAN) and Silicon Valley Toxic Coalition (SVTC) revealed that 70% of heavy metals found in landfills in the USA come from e-waste (Puckett at al. 2002). E-waste is also disposed of in incinerators. The presence of flame retardants and chlorine elements in plastic (which is used as casings in many electrical and electronic products) can lead to the release of dangerous gases such as dioxins, furans, polycyclic aromatic hydrocarbons (PAHs), polyhalogenated aromatic hydrocarbons (PHAHs) and hydrogen chloride in the burning process which could contaminate the air through smoke and dust (Robinson 2009), and may enter human's system through ingestion, inhalation and skin absorption (Mielke and Reagan 1998 in Robinson 2009).

In addition to entering household waste streams, some e-waste is also recycled. However, as e-waste is classified as hazardous waste, the cost of recycling it in an environmentally sound treatment plant is high; urging owners of e-waste recycling business to opt for cheaper alternatives. One possible alternative is for e-waste to be recycled in less economically developed countries where the cost of labour is cheaper. As e-waste recycling provides job opportunities and lucrative business for many people in these countries, e-waste has become a

sought after ‘commodity’. This has triggered the proliferation of e-waste trading.

E-waste trading between the more economically developed countries (mostly from the European Union (EU) and USA) and the less economically developed countries (mostly in Asia and Africa) burgeoned during the 1990s, despite the restriction on export and import of hazardous waste imposed by the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal (hereinafter, Basel Convention). An unknown quantity of e-waste enters the informal recycling industry in the less economically developed countries (Robinson 2009) such as India, China, Pakistan, Malaysia and a few African countries (Johri 2008). Often in this case, a very crude way of e-waste dismantling and processing are involved such as acid bath (where printed circuit boards are immersed in sulphuric acid and nitric acid solution), and burning of wire cablings to recover copper. Although some valuable elements (such as gold, silver and copper) are recovered in the process, a large proportion of toxic materials (heavy metals, brominated flame retardants, other chemicals) are dumped into the vicinity. The hazardous substances may be released into or accumulated in the environment, and create risk for other people. For example, rainwater may wash off these toxic substances to the low-lying agricultural land, thus raising the probability of bioaccumulation by crops, polluting the groundwater and contaminate the underground aquifers (Sarkar 2008). The toxic chemicals may therefore not only affect the workers, but also pollute the environment (Pucket et al. 2002).

The widespread, intricately complex and risky nature of e-waste demands calls for close policy attention at all levels of society, and between government and non-governmental actors. In this respect, it is a classical issue of environmental governance rather than of government. Most of the literature in environmental governance (and e-waste governance in particular) has focused on its emergence and development in the more economically developed countries in

the Global North such as the European countries and the USA. There is an obvious gap in the literature on the governance of e-waste in the less economically developed countries in the Global South, and this thesis intends to fill the gap.

South East Asia region in the Global South is exposed to the possibilities of leakage of hazardous waste from the movement or transit of e-waste from countries in the West to countries in the East, and the possibilities of e-waste smuggling activities, due to its location which lies in the middle of the e-waste trading route. Most of the studies on e-waste governance have looked at the issue of managing transboundary e-waste movement especially its impacts on the receiving countries in the Global South, thus reinforcing the idea of an affluent Global North and a destitute Global South as black and white categories. However, e-waste trading is more than 'a story of rich countries dumping waste in poor countries' (Lepawsky and McNabb 2010: 177) as there are evidence of e-waste trading among 'poor countries' (Lepawsky and McNabb 2010), and affluent sections of the societies in the Global South which are generating e-waste at an increasingly rapid rate; which have been overlooked in many studies. In a country like Malaysia, for example, the volume of e-waste in the waste stream is a combination of those generated by the local industries and households, and also imported from other countries. This research intends to fill in the gap by focusing on the governance of domestically generated e-waste in Malaysia. It seeks to examine this issue through the debates on governance where governance is understood as a process of societal steering which involves the state and non-state actors. Its aim is to investigate the roles of state and non-state actors in e-waste governance in Malaysia and to reflect on the consequent implications for how we might understand the nature of environmental governance 'beyond' the most economically affluent parts of the world.

In the next section (Section 1.2), a brief review of e-waste crisis in Malaysia is presented. This is followed by descriptions of the research aim and the research questions emanated from it in Section 1.3. Finally, in Section 1.4, the outline of this thesis and a brief description of each chapter are presented.

## 1.2 E-waste Crisis in Malaysia

Malaysia plays a dual role in e-waste trading – as an importer and exporter of e-waste. The geographic location of Malaysia, which lies in the middle of international e-waste trade route (refer Figure 2.4) makes it an attractive target for e-waste smugglers. According to Puckett (2005), Malaysia is one of the countries which receive the e-waste from the USA other than China, India, Pakistan, Vietnam, the Philippines, Nigeria and Ghana (Puckett 2005), Brazil and Mexico (Robinson 2009). Other than receiving e-waste, Malaysia is said to export e-waste to other less economically developed country such as India. In a short documentary on e-waste recycling activities in India, which was filmed in summer 2008 by SVTC (Silicon Valley Toxic Coalition, an NGO based in Seattle, USA), one of the e-waste recycling operators who was interviewed admitted that he received supply of e-waste for his business from Malaysia, other than the USA (SVTC website at http://svtc.org/our-work/e-waste/). This is happening despite the fact that Malaysia is a party of Basel Convention, and restricts import/export of e-waste with national level law (Section 34B of Environmental Act 1974).

Malaysia is also facing problems with rapid growth of domestic e-waste volume. With the increasing number of Malaysia's population living in urban areas and adopting modern lifestyles (due to economic transformation from agricultural-based to industrial-based socio-economies in the 1980s), the generation of domestic e-waste is expected to grow. An inventory of domestic e-waste generation in Malaysia conducted by Malaysian Department of Environment (DOE) with the cooperation of EX Corporation, Japan has

revealed that Malaysia generated 688,000 metric tonnes of e-waste in 2008, and the volume is forecasted to reach 1.11 million metric tonnes in 2020 (E-waste Inventory Project in Malaysia Report 2009). Other than the increasing amount of e-waste, another issue regarding e-waste in Malaysia is improper disposal of e-waste (refer Plates 5.1 to Plates 5.6) and illegal e-waste recycling. These activities have the potential to pollute the environment and pose significant health hazard to the society.

## 1.3 About the Research

The main aim of this research is to investigate the roles of state and non-state actors in e-waste governance in Malaysia, particularly focusing on the governance of the locally generated industrial and household e-waste. Based on this aim, five following research questions emanate which are;

1. Who are the actors involved in e-waste governance in Malaysia?
2. How, why and with what implications are these actors involved in e-waste governance?
3. What and how significant are the roles of state and non-state actors in different modes of governance?
4. How, why and with what implications are state and non-state actors working in partnership?
5. What is the most dominant and significant mode of e-waste governance in Malaysia, and what are the consequent implications?

This research is based on qualitative research methodology. Qualitative research methodology was chosen over quantitative research methodology because of its suitability with respect to the research questions stated above. One particular type of qualitative research approach, i.e. the case studies approach was applied in conducting this research. Data for the research were collected by adopting three main data collection techniques: in-depth

interviews with the key players in e-waste governance from the public sector, private sector, and civil society organizations (CSOs); observations (of the public-private partnership (PPP) programmes); and the review and analysis of policy documents and grey literature. These data were analysed by adopting the thematic analysis method.

## 1.4 Outline of the Thesis Structure

Following this introductory chapter, Chapter 2 discusses the complexity of e-waste as an environmental issue. This chapter begins with the analysis of the different nomenclature and interpretations surrounding the use of the term 'e-waste' in the literature. It provides information on the context of the growing problem of e-waste, especially the rapid increase of e-waste volumes worldwide and their hazardous content. Due to the high economic value of some of the materials in the e-waste, it is being traded (and smuggled) between countries and treated (recycling and material recovery) legally and illegally in many countries worldwide. This chapter discusses this issue and its impact.

Chapter 3 focuses on the conceptual and theoretical framings of this research. It explores the literatures on governance, and develops a framework that regards governance as operating through multiple actors, levels and modes. It examines the application of this concept in environmental governance, waste governance and e-waste governance, and identifies the key issues for empirical investigation. This is followed by Chapter 4 which focuses on the research methodology. In this chapter, the rationale for choosing a qualitative research methodology, and specifically a case study approach, are presented. The data collection methods (in-depth interviews, observations and review of documents) and data analysis technique (thematic analysis) are discussed, and their strengths and weaknesses evaluated, alongside an analysis of the experience of conducting the research.

Chapter 5, Chapter 6, and Chapter 7 present the empirical findings of this research. Chapter 5 is centred on the roles of state actors while Chapter 6 is focused on the roles of non-state actors. The roles of state (in Chapter 5) and non-state actors (in Chapter 6) are presented based on the different modes of governing identified in Chapter 3 as involved in the process of environmental governance: hierarchy, persuasion and self-governance modes. Chapter 7 presents the results of analysis of the roles of state and non-state actors in one variant of co-governance mode, the public-private partnership (PPP). Two PPP case studies were selected for in-depth research and are analysed in this thesis. Chapter 7 reports the background of these PPPs and related data analysis results, such as the limitations and implications of PPPs. In conclusion, Chapter 8 analyses the multiplicity of e-waste governance (in terms of levels, actors (and their roles) and modes) in Malaysia. In addition, it reflects on the theoretical and methodological limitations of this research, its potential policy relevance and recommendations for policy and future research.

## Chapter 2: E-Waste: A Consequence of Modern Life?

### 2.1 Introduction

Waste is defined in EU Directive as 'any substance or object which the holder discards, or intends to discard, or is required to discard' (Directive 75/442/EEC, Article 1(a)). Generally, waste is understood as something that is not needed by the current owner and is ready to be thrown away (Davoudi 2009). To facilitate the process of waste management, wastes are classified into categories. Three most common systems of classifying waste are based on level of toxicity and risk, chemical composition and source of generation. The first system (based on level of toxicity and risk) divides waste into two groups of hazardous and non-hazardous waste; the second system (based on chemical composition) divides waste into inorganic or organic/ microbiological waste; and the third system (based on the source of waste generation) divides waste into municipal, industrial, clinical, agricultural, commercial, and construction and demolition waste (Williams 2005). The way waste is understood and defined, affects the way it is governed (Davoudi 2009). In Malaysia for example, the governance of waste is based on the level of toxicity of waste; which is used as the basis for the categorization of waste into two broad groups of hazardous and non-hazardous waste.

As mentioned in the introduction of this thesis (Section 1.1), hazardous waste from used electrical and electronic equipment (or e-waste) has entered the waste stream at a rapid rate since early 1990s. This chapter seeks to examine the effect of e-waste from an environmental perspective. The discussion begins with a discourse on the definition and the different interpretation of the term 'e-waste' in Section 2.2. This is followed by Section 2.3, where the discussion is focused on the environmental consequences of e-waste. E-waste is considered as a crucial environmental issue due to its rapidly growing volume and hazardous content which may leak into the environment if it is not

properly disposed of, and cause adverse effect on human health and the environment. The toxicity effects (which may occur immediately at the point of release, or cause long term chronic toxicity) and the environmental persistence of hazardous compounds are the critical issues in the management of e-waste. Issues of e-waste management are discussed in Section 2.4. Due to the nature of e-waste which is hazardous, but valuable at the same time, recycling and recovery of materials are often adopted as a management strategy by many countries around the world. However, the economic value which is attached to e-waste has brought many problems such as e-waste smuggling and the growth of recycling activities by the informal sector especially in the less economically developed countries. Finally, in Section 2.5, the challenges of e-waste management in Malaysia are reported, including improper disposal, illegal import and unlicensed e-waste recycling activities; providing the specific context within which the research for this thesis has been based.

## 2.2 E-waste: Definition and Nomenclature

E-waste is a global issue and in the international arena, it is governed by the United Nations (UN) through the Basel Convention. The Basel Convention defines e-waste as;

> ‘Waste electrical and electronic assemblies or scrap containing components such as accumulators or other batteries included in list A, mercury switches, glass from cathode ray tubes, or other activated glass and PCB (polychlorinated biphenyl) capasitors, or contaminated with Annexe I constituents (for example, cadmium, mercury, lead, PCB) to an extent that they posses any of the characteristics contained in Annexe III’ (UN Basel Convention).

As the authority to govern e-waste trickles down from the global authority (UN) to the governments at lower levels such as regional (example European Union), state and local levels, so has it influenced the interpretation of e-waste. In Malaysia for example, e-waste is defined by the law as:

> 'Waste from the electrical and electronic assemblies containing components such as accumulators, mercury-switches, glass from cathode-ray tubes and other activated glass or polychlorinated biphenyl capasitors, or contaminated with cadmium, mercury, lead, nickel, chromium, copper, lithium, silver, manganese or polychlorinated biphenyls' (Guidelines for the Classification of Used Electrical and Electronic Equipment in Malaysia, available at www.doe.gov.my).

At the regional level, within the EU the term WEEE (Waste Electrical and Electronic Equipment) is widely used instead of e-waste to refer to end-of-life and disposed electrical and electronic equipment. WEEE is understood in the EU under the Directive on Waste Electrical and Electronic Equipment (Directive 2002/96/EC, Article 3(b)) and the Directive on Waste (Directive 75/442/EEC, Article 1(a)) as 'any electrical and electronic equipment (including all components, subassemblies and consumables which are part of the product at the time of discarding) which the holder discards or intends to or is required to discard'. The Directive on Electrical and Electronic Equipment (Directive 2002/96/EC, Article 3(a)) also provide the definition for electrical and electronic equipment (EEE), which is as the following (with emphasis added in square brackets):

> 'Electrical and electronic equipment' or 'EEE' means equipment which is dependent on electric currents or electromagnetic fields in order to work properly, and an equipment for the generation, transfer and measurement of such currents and fields falling under the categories set out in Annexe 1A [to the WEEE Directive], and designed for use with

voltage rating not exceeding 1000 volts for alternating current and 1500 volts for direct current' (Directive 2002/96/EC, Article 3(a)).

Under EU legislation, WEEE is divided into ten categories as listed in Table 2.1. Based on this categorization (and interpreted together with the definition of WEEE and EEE in Directive 2002/96/EC, Article 3(a) and Article 3(b)), several scholars such as Robinson (2009), Streicher-Porte et al. (2005) and Johri and Basu (2008) consider only category 3 (Information Technology and telecommunication equipment) and category 4 (consumer equipment) from this list as e-waste, leading to an interpretation that e-waste is a subset of WEEE. However, the majority of studies in e-waste (see Steubing et al. 2010, Chancerel and Rotter 2009, Khetriwal et al. 2009, Deathe et al. 2008, Nnorom and Osibanjo 2008, and Davis and Heart 2008, Puckett et al. 2002) interpret e -waste as a term encompassing a broad and growing range of electronic and electrical devices, which have been discarded by their owners. As such, with this understanding, the terminology (e-waste and WEEE) is analogous; which means the terms can be used to refer to the discarded electrical and electronic equipment. There are also scholars (see Dwivedy and Mittal 2010 and Bandyopadhyay 2008) who view the terms from another perspective (i.e. from the formality aspect) and consider e-waste as an informal, but a more popular name for WEEE, but both would bring the same meaning; while Chancerel and Rotter (2009) suggest that e-scrap is another synonymous term to WEEE and e-waste.

Table 2.1: The ten categories of WEEE under EU directive

| **No** | **Category** | **Label** |
|---|---|---|
| 1 | Large household appliances | Large HH |
| 2 | Small household appliances | Small HH |
| 3 | Information Technology and telecommunication equipment | ICT |

| No | Category | Label |
|---|---|---|
| 4 | Consumer equipment | CE |
| 5 | Lightning equipment | Lighting |
| 6 | Electrical and electronic tools (with the exception of large scale stationary industrial tools) | E&E tools |
| 7 | Toys, and leisure and sports equipment | Toys |
| 8 | Medical devices(with the exception of all implemented and infected products) | Medical equipment |
| 9 | Monitoring and control instruments | M&C |
| 10 | Automatic dispensers | Dispensers |

Source: EU Directive (Directive 2002/96/EC)

Besides the confusion regarding the terminology, determining whether a product is an electrical or electronic device can sometimes be confusing. A clear delineation between electrical and electronic equipment is becoming increasingly difficult to achieve due to the wide incorporation of electronic programmable micro processors into equipment which have traditionally been regarded as electrical devices such as refrigerators, washing machines and ovens, thus transforming them into electronic devices (Robinson 2009, Hilty 2005, and Kohler and Erdmann 2004). As such, UNEP's definition that interprets e-waste as 'a generic term encompassing various forms of electrical and electronic equipment (EEE) that are old, end-of-life electronic appliances and have ceased to be of any value to their owners' (UNEP 2007) is the most practical and reasonable in the context of this study and will be adopted in this chapter and throughout the thesis.

## 2.3 E-waste as a Contemporary Environmental Issue

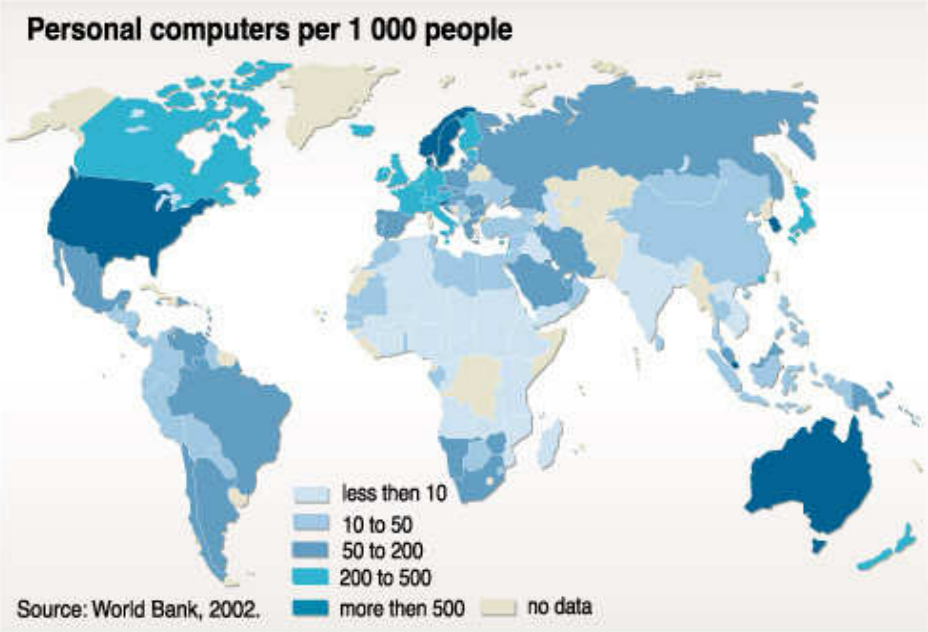
E-waste has become a serious environmental issue since the early 1990s due to two reasons - its rapid growth in volume and its hazardous content. As a new

addition to the waste stream, the emergence and rapid increase of e-waste demands a comprehensive management system. Although the amount of hazardous substances in e-waste is generally small (they constitute 2.7% of the total elements of e-waste (Bandyopadhyay 2008) or 9% of the weight of e-waste (Umweltbundesamt 2006, in Sarkar 2008)), they have significant impact due to the hazardous nature, high concentration level and their persistence when discharged to the environment which may have long term effects on public health and the environment.

### 2.3.1 The Rapid Growth of E-waste

As mentioned in the introduction (Section 1.1), e-waste is one of the fastest growing waste streams in the world (Nnorom and Osibanjo 2008, Jain 2008, Cui and Forssberg 2003), with estimated world's generation rate at 40 million tonnes per year (UNEP 2010, Schluep et al. 2009). Although there has been several attempts to estimate the growth of e-waste in several countries in the world (such as the work of Cobbling (2008) in USA, Sinha-Khetriwal et al. (2005) in Switzerland, Liu et al. (2006) in China), the estimation and reporting system applied are not uniform, hence is not precise for comparison purposes. Robinson (2009) claims that the growth of e-waste is strongly correlated positively with the Gross Domestic Product (GDP) of a country. Robinson (2009) found that his finding agrees with the prediction of e-waste production in Europe by Hischier et al. (2005), who noted that the annual e-waste growth rate in Europe in the three-year period (between the years 2005 to 2008), is at 3% to 5%, during which the average increase of GDP is 2.6%. According to NGOs – the Basel Action Network (BAN) and the Silicon Valley Toxic Coalition (SVTC) – the rate of e-waste increase is three times faster than the increase in regular municipal waste (Puckett et al. 2002). The rapid increase of e-waste is due several factors.

One factor is the exponential rise of personal computers ownership due to the emergence of the internet in early 1990s (Campbell and Hassan 2003). Countries like the USA, Australia, Japan, Singapore and the Scandinavian region have the highest recorded number of personal computers per head worldwide, with more than five hundred computers per thousand people (Figure 2.1).




Source: Rekacewicz, 2004 [http://maps.grida.no/go/graphic/personal-computers-per-1000-people]

Figure 2.1: The concentration of personal computers ownership across the globe

With computer manufacturers competing intensely in terms of innovation, the raw processing power of computers is rapidly increasing, resulting in a large number of machines becoming obsolete in increasingly short periods of time (Campbell and Hassan 2003) and subsequently contributing to the increase in the amount of e-waste production. Moreover, as more computers are manufactured, economies of scale have given way to much lower prices for

computers, thus increasing the global demand (and contributing to more e-waste generation). While the increasing sales of computers in the less economically developed countries is due the success of penetration market, the increase in the more economically developed countries is due to replacement market. In the USA for example, the life span of computers was four to six years in 1997, but by 2005 had been drastically reduced to less than two years (Babu et al. 2007). As such, Robinson (2009) suggests that the driving force behind e-waste production is the rapid growth of computers and computing systems.

Other than computers, another factor which is contributing to the rapid increase in the volume of e-waste worldwide is innovations in televisions, such as the migration from analogue to digital and from CRT to flat-screen technologies. Televisions' owners are discarding their old device for new flat-screen- digital sets to keep up with the advance technology. Another factor which contributes to the trend is the wide usage of mobile phones as communication via satellites was made easier in the 1990s. Tremendous technology revolutions in communication industry, and its very rapid advancement (where mobile phones are doing more than just connecting people, but are also multi functioning as camera, audio visual recorder and player and much more besides), have resulted in the increase in e-waste volume as people frequently opt for the latest version of devices with upgraded features.

In the process of planning for e-waste future management, e-waste managers normally make estimates of future e-waste generation amount based on the amount of equipment sold. Logically, the impact to the environment rises with the increase in the amount of e-waste. However, this may not necessarily be always true for two reasons. Firstly, the total quantity of e-waste, especially in the less economically developed countries, is not only contributed by domestic sources but also from legal and illegal imports, mostly from more

economically developed countries (Streicher-Porte et al. 2005, Widmer et al. 2005). And secondly, the impact of e-waste to the environment differs depending on the type of devices (Robinson 2009). According to Robinson (2009), the impact of e-waste to the environment depends on a combination of several factors such as the mass or the weight of the item and its average lifespan, and is not linearly dependent on the amount of items disposed. He suggests that the contribution of an item to annual e-waste generation can be reduced to a formula, as follows: *E* (kg/year of waste) depends on the mass of the item *M* (kg), the number of units in service *N* and its average lifespan *L* (years) [1] ; or E = MN/L [1] ( Robinson 2009: 184).

As such, a computer, which has an average lifespan of three years and weighs 25 kg, contributes a higher proportion of e-waste compared to a refrigerator which weighs 35 kg and has a life span of ten years. Table 2.2 lists the weight and typical life span of common electrical and electronic items which can be used to estimate annual e-waste generation more precisely according to Robinson's formula.

Data on current amount and projection of future production of e-waste are paramount in e-waste management. Disposal of e-waste is more complicated than normal household waste because of its hazardous content; and is definitely more than just lack of space as commonly the case of solid waste management. Lack of appropriate facilities, weak enforcement (or lack of) law and regulation, and low level of awareness among the society may lead to indiscriminate or improper disposal (such as disposing e-waste together with households solid waste). The following sub-section discusses the consequence of improper e-waste mangement to the environment and human health.

Table 2.2: The weight and expected life span of some common e-waste items

| **Device** | **Weight of device (kg)** | **Typical life span (year)** |
|---|---|---|
| Computer[1] | 25 | 3 |
| Facsimile machine[2] | 3 | 5 |
| Mobile phone[3] | 0.1 | 2 |
| Electronic games[3] | 3 | 5 |
| Photocopier[2] | 60 | 8 |
| Radio[3] | 2 | 10 |
| Television[o] | 30 | 5 |
| Video recorder and DVD player[3] | 5 | 5 |
| Refrigerator[3] | 35 | 10 |
| Microwave oven[3] | 15 | 7 |
| Air conditioning unit[2] | 55 | 3 |

Sources:

[o] Li et al. 2009

[1] Betts 2008

[2] Robinson 2009

[3] Cobbing 2008

### 2.3.2 The Hazardous Content of E-waste

E-waste is composed of a mixture of metals - particularly copper, aluminium and iron - which are attached to, covered with or mixed with various types of plastic and ceramic (Hoffmann 1992). However, according to Widmer et al. (2005), a detail account of e-waste content, produces a list of more than one thousand chemical substances. These substances are grouped into three categories based on their relative amount in e-waste, such as: bulk elements (such as lead, tin, copper, silicon, carbon, iron and aluminium), elements in small quantity (such as cadmium and mercury), and trace elements (such as

platinum, arsenic, silver, gold, lithium, titanium, cobalt, manganese and many others). The composition of e-waste (including the type and percentage of materials) varies depending on the type of equipment, as shown in Table 2.3. As evident from Table 2.3, ferrous metal (iron) made up the bulk of most of the electrical and electronic devices compared (except for mobile phones where the percentage of copper is higher than ferrous metal).

As mentioned in Section 1.1, e-waste content is a significant environmental issue due to its toxicity (Widmer 2005). The adverse health effects of major hazardous substances in e-waste are presented in Table 2.4. Besides the hazardous substances, there are several types of trace elements in e-waste (such as platinum, silver, gold, and titanium) which are precious materials, while some are both precious and hazardous (such as copper, mercury, lead and cadmium). The contradiction between environmental and economic value of e-waste has made e-waste management a daunting challenge.

Table 2.3: Percentage of iron, aluminium, copper and lead content in different electrical and electronic devices

| **Type of metal** | **Percentage of content in devices (%)** | | | | |
|---|---|---|---|---|---|
| | **Personal Computer[1]** | **Television[2]** | **Mobile phone[3]** | **Portable audio[2]** | **DVD player[2]** |
| Iron (Fe) | 20 | 28 | 3 | 23 | 62 |
| Aluminium (Al) | 14 | 10 | <1 | 1 | 2 |
| Copper (Cu) | 7 | 10 | 15 | 21 | 5 |
| Lead (Pb) | 6 | 1 | <1 | 0.14 | 0.3 |

Sources:

[1] Devi, Shobha and Kamble (2004)

[2] Hageluken (2008)

[3] http://www.envocare.co.uk/mobile_phones.htm

The toxic elements in e-waste may be released to the environment in three ways. Firstly, due to improper disposal of e-waste, where e-waste is commonly disposed of together with municipal solid waste and ended in non-hazardous landfill or being incinerated, and some are just dumped indiscriminately. In these instances, the toxic elements in e-waste may enter the soil and contaminate the groundwater, or enter the atmosphere as toxic fumes if burning is used as a way of disposal. In the USA, it is estimated that 70% of mercury and cadmium pollution, and 40% of lead pollution in landfills are caused by leakage of e-waste (Puckett et al. 2002). Secondly, toxic substances are released into the environment through improper dismantling and precious material recovery processes, where open burning and acid baths are used to recover precious material, which release toxic substances into the air, soil and water, while the less precious (but highly hazardous materials) are disposed of in an unsafe manner. Finally, hazardous substances have the potential to enter the environment through possible leakage in the process of movement of e-waste from one country to another.

Table 2.4: Hazardous substances in e-waste and its effects on health

| **Substances/contaminants** | **Use in electrical and electronic devices** | **Adverse health effect *** |
|---|---|---|
| Copper (Cu) | Wiring [1] | May damage liver, kidney and nervous system, and affecting protein metabolism in the brain causing Alzheimer disease. |
| Nickel (Ni) | Batteries | An uptake of too large quantities of nickel may cause cancer of the lung, |

| Substances/contaminants | Use in electrical and electronic devices | Adverse health effect * |
|---|---|---|
| | | nose, larynx and prostate, dizziness, respiratory failure (such as asthma and chronic bronchitis, birth defects, and allergic reactions such as skin rashes. |
| Lithium (Li) | Batteries | Corrosive to the eyes, skin and respiratory tract. |
| Chromium (Cr) | Data tapes and floppy disks.[1] | Irritates eyes, skin and mucous membranes and DNA damage. |
| Lead (Pb) | Solder [2], CRTs, batteries[1] | Damages the central and peripheral nervous system, kidney and endocrine system. |
| Cadmium(Cd) | Batteries, toners, Plastics [1] | Affects the kidneys, cardiovascular system, bones and testicular function, and damaging the DNA. |
| Mercury (Hg) | Fluorescent lamps, batteries, switches[1], circuit board, semiconductors. | Toxic to lungs, kidney, nervous system and digestive system. |
| Barium (Ba) | Getters in CRTs[1] | Swelling in the brain, muscle weakness and damage to the heart, liver and spleen. |
| Beryllium (Be) | Silicon-controlled rectifiers[1] | Lung and skin disease. |

| **Substances/contaminants** | **Use in electrical and electronic devices** | **Adverse health effect *** |
|---|---|---|
| Aluminium (Al) | Chips, data storage disks | Affects brain and kidneys and may be associated with Alzheimer and Parkinson disease. |
| Antimony | Flame retardants[3] | Affects cardiovascular system, stomach, joints, muscles and bones. |

Sources:

*Sarkar (2008)

[1] Robinson (2009)

[2] Kang and Schoenung (2005)

[3] Ernst et al. (2003)

## 2.4 E-waste Management

In order to cope with the increasingly demanding and complex waste issues, waste management practices have become more holistic in recent years; thus resulting in new approaches and principles such as the waste management hierarchy, integrated solid waste management and zero waste concepts. This section explains the concept of the waste management hierarchy and its influence in e-waste management.

The waste management hierarchy is a strategy which is based on a ranking of waste management solutions from the most to the least desirable options (see Figure 2.2) (Davies 2008, Tchobanoglous et al. 1993). The ranking is based on environmental values such as energy conservation, resources conservation, pollution prevention or minimisation, and health and safety protection (Davies 2008, Tchobanoglous et al. 1993). Although the ordering of waste management hierarchy varies in different countries, the format which is generally accepted worldwide places waste prevention at the top of the hierarchy and waste disposal at the bottom of the hierarchy with energy recovery and recycling/re-use of materials sandwiched between the two (Davies 2008). The five main elements of waste management hierarchy are summarised in Table 2.5.

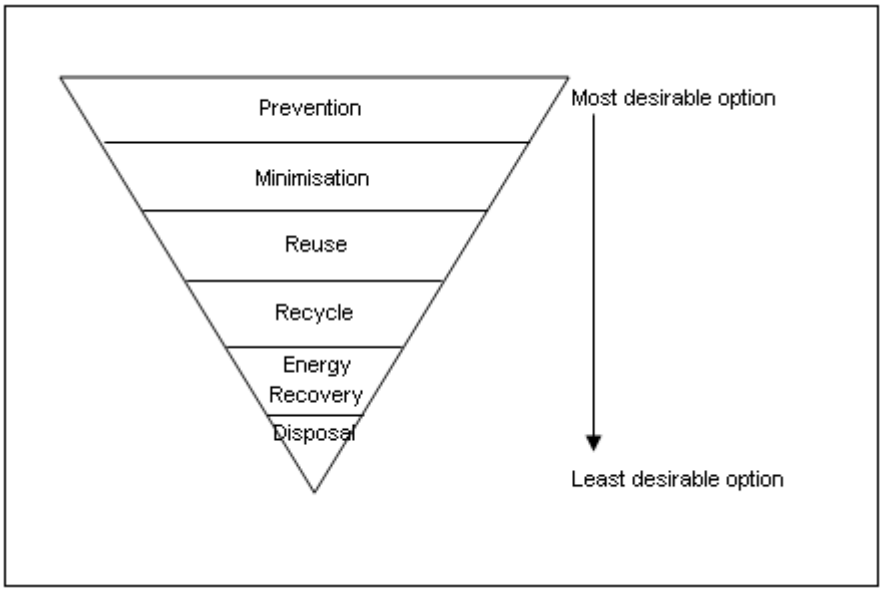



Figure 2.2: Generally accepted format of waste hierarchy

Table 2.5: Description of five main techniques of waste management hierarchy

| **Process** | **Description** |
|---|---|
| Waste prevention/reduction/ minimisation | • A process of reducing the amount and/or toxicity of waste.<br>• May occur through the design, manufacture and packaging of products with minimum toxic content, minimum volume of material or a longer useful life.<br>• The most effective way to reduce the quantity of waste and the cost associated with its handling and its environmental impacts. |
| Reuse | • A process which involves using the items in another way, when their primary use is finished.<br>• It extends the life cycle of an item, which may eventually be discarded. |
| Recycling | • A process which is possible in helping to reduce the |

| Process | Description |
|---|---|
| | demand on resources and the amount of waste requiring disposal by landfilling.<br>• It involves three stages: the collection and separation of waste materials; the preparation of these materials for reuse, reprocessing and manufacture; and the reuse, reprocessing, and remanufacture of these materials. |
| Energy and material recovery | • Involves the physical, chemical or biological alteration of wastes to improve the efficiency of waste management operations, to recover reusable and recyclable materials or to recover conversion products and energy in the form of heat and combustible biogas.<br>• Usually results in the reduced use of landfill capacity. |
| Disposal (Landfill) | • It is the last option in waste management.<br>• Is used to handle waste that cannot be recycled, the residual matter remaining after wastes have been separated at materials recovery facilities or after the recovery of conversion products or energy. |

Source: adapted from Tchobanoglous et al. (1993).

In managing e-waste, the substantial factor which has been crucial in determining the decisions on e-waste management is the nature of the waste which is highly hazardous (which means disposal without treatment must be avoided at all costs), and the potential for recovering economic value through the re-use of the precious metals which e-waste contains. Due to these considerations, the majority of countries are adopting strategies which lie in the middle of the waste management hierarchy triangle, (which are reuse, recycle and material recovery) to manage e-waste, with the exception of

countries in the EU region which have begun to apply the waste prevention/reduction/ minimization strategy with the introduction of two directives – the Directive on Waste Electrical and Electronic Equipment (2002/96/EC) (or the WEEE Directive) and the Directive on Restriction of the Use of Certain Hazardous Substances (2002/95/EC) (or the RoHS Directive). The WEEE and RoHS directives entered into force on 27 January 2003, although the first draft was conceived since 1995 (Khetriwal 2008). The WEEE directive calls for overall reduction of e-waste and the adoption of sound disposal methods, while the RoHS calls for comprehensive management of e-waste by product regulation and restriction on certain hazardous chemicals.

The RoHS Directive is meant to prevent the generation of hazardous waste. This is achieved by substituting various heavy metals (lead, mercury, cadmium, hexavalent chromium) and two brominated flame retardants (BRF) - polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE) - with less hazardous material in the new electronic and electrical equipment which were put on the market from 1 July 2006. The RoHS Directive specifies the maximum concentration values allowable for each substances; which is 0.01% by weight for cadmium and 0.1% by weight of the other five substances in production of homogeneous material (such as individual types of plastics, ceramics, glass, metals, alloys, paper, board, resins and coatings).

On the other hand, the aim of WEEE is to limit the total quantity of waste going to final disposal site by increasing the recycling of electrical and electronic equipment (EEE), where producers (including EU based manufacturer, reseller and importer of equipment) are required to set up a take-back system so that WEEE can be returned free of charge and collected separately. This has resulted in increasing adoption of Extended Producers Responsibility (EPR) principle in e-waste law of EU member countries; which has also penetrated into countries outside EU such as China (Wagner 2009,

Khetriwal et al. 2009). Apart from product take-back, WEEE also places two other responsibilities upon producers; first, for spreading awareness among private household users about the directive's separate collection and return system and its role in contributing to reuse, recycling and other forms of recovery of WEEE, the hazardous nature of WEEE, and the meaning of the symbols used on the products; and second, for designing products in a way that facilitates the reuse, recycling and recovery of materials. Targets on collection of e-waste (Article 5) and on recovery of e-waste (Article 7) of WEEE directive are set based on weight, which overlooks the fact that some hazardous substances possess environmentally-disastrous potential even if they are present in small quantity and have a low physical weight (Khetriwal et al. 2008).

The RoHS Directive is complementary to the WEEE Directive in the attempt of EU to regulate e-waste in the region. Both directives require EU member states to adopt and implement national laws by 13 August 2004 or face action in the European Court of Justice (Mohan et al. 2008). This has forced all member countries to come out with national law on WEEE and RoHS. For example, UK's regulations on e-waste control were laid before the Parliament on 12 December 2006, and entered into force by 'The Waste Electrical and Electronic Equipment Regulations 2006' (amended 2007), on 2 January 2007 (UK Environment Agency website, http://www.legislation.gov.uk).

E-waste recycling as a management option which is strongly encouraged under EU's WEEE directive, and is also adopted in many other countries outside the EU (for example, in Japan under the Home Appliances Recycling Law 2001 and Korea under EPR in Recycling Law 2003) has clear environmental advantages based on the Life Cycle Analysis (LCA) study on two Swiss take-back and recycling systems in Switzerland conducted by Hischier et al. (2005). However, due to its economic value, e-waste has also been recycled without environmental considerations, particularly in the less economically developed

countries such as in India (Sarkar 2008, Sinha 2008, Sinha-Khetriwal et al. 2005) and China (Li et al. 2008, Wong et al. 2007) creating social and political issues. In the following sub-section (Section 2.4.1), the process of e-waste recycling in an environmentally sound manner and in an environmentally improper manner (Section 2.4.2) are described and compared. Descriptions of the potential environmental and health hazards in crude e-waste recycling process are also presented. In Section 2.4.2 discussions are focused on the trading of e-waste (including smuggling, pretext donation and genuine donation) from the Global North to the Global South.

### 2.4.1 E-waste Recycling and Material Recovery Processes

Generally, e-waste recycling process is understood as the processes of dismantling and destructing end-of-life electrical and electronic equipment to recover useful materials (Cui and Zhang 2008) (see Plate 2.1 and Plate 2.2 which shows the dismantled components of a computer and of a mobile phone respectively, which are ready to undergo a series of processes before materials are recovered). However, a more detail study of e-waste recycling process revealed that it is an intricate and complex process which involves interconnecting steps (see Figure 2.3) including collection, testing and sorting, dismantling, shredding, smelting and refining of various materials and metals, before new material can be recovered (Hageluken 2008). Figure 2.3 illustrates the major steps and flows of the recycling process of obsolete computers and the end products.

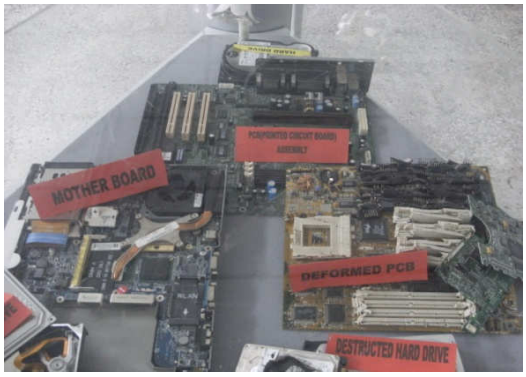



Plate 2.1: Dismantled components of a computer. (Source: author - courtesy of Tes-Amm (M) Sdn. Bhd.)


Plate 2.2: Dismantled components of a mobile phone. (Source: author - courtesy of Tes-Amm (M) Sdn. Bhd.)

The efficiency and level of success of a recycling process depends not only on the efficiency of each single step in Figure 2.3, but also determined by many other factors such as availability of adequate infrastructure (which includes transportation, collection, recovery and resale establishments), availability of trained workers, awareness among consumers and recyclers of the potential hazards of e-waste, availability of appropriate technology and experience at all levels from collection to processing and disposal (Hageluken 2008, Kang and Schoenung 2004).

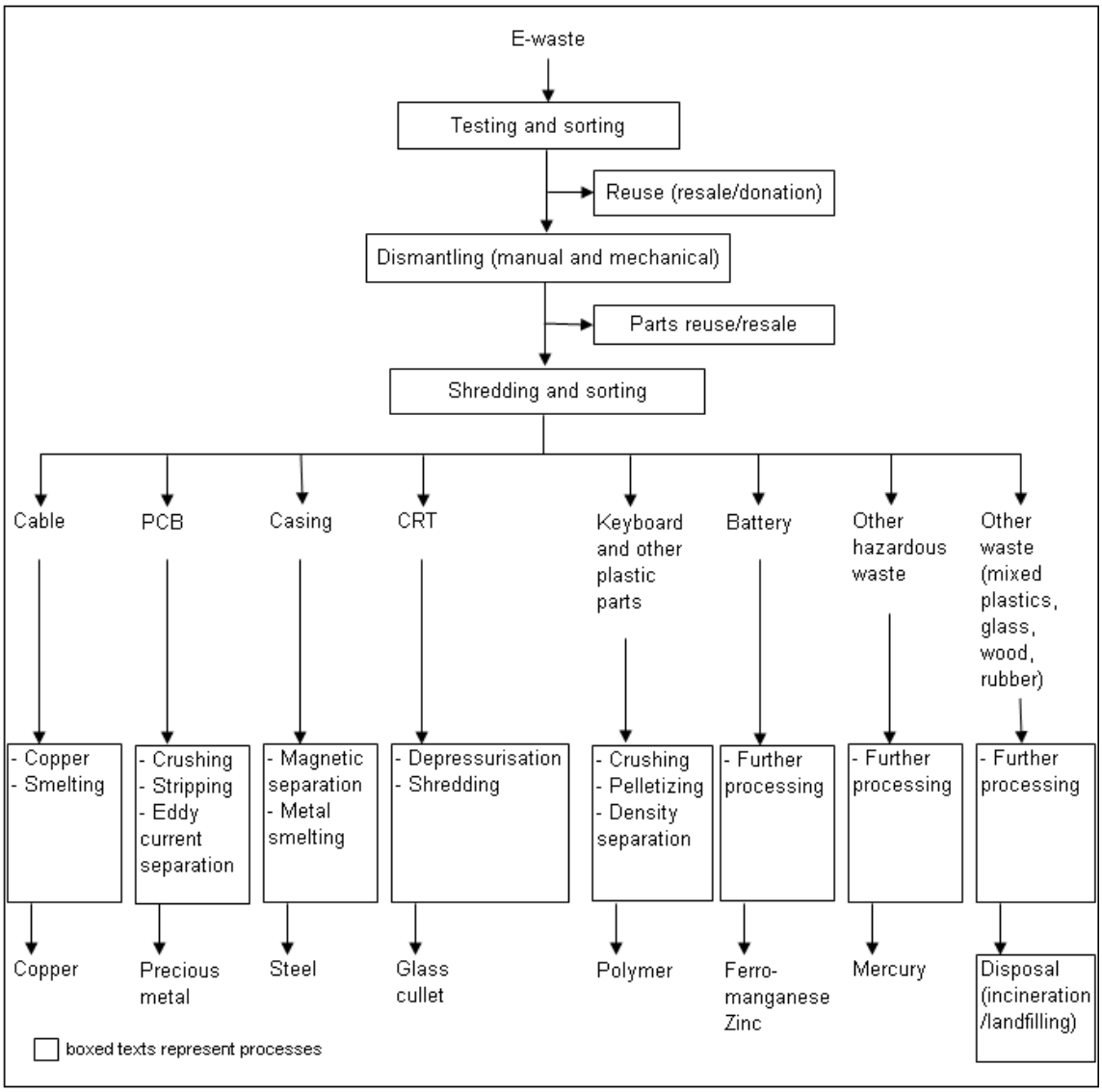



Figure 2.3: The computer recycling and material recovery processes and outputs.

According to Hageluken (2008), most of the precious metals in e-waste such as gold, silver and platinum are found in the printed circuit boards (refer Figure 2.3 and Plate 2.3); however, printed circuit boards also contain most of the toxic substances found in e-waste, thus making e-waste recycling a very risky activity. An example of the route undergone by a printed circuit board in material recovery process is explained below. In a recovery plant, printed circuit boards will first undergo mechanical crushing and stripping process (see Plates 2.4 and Plate 2.5) for several times until it is finely crushed (see Plate 2.6). The finely crushed printed circuit boards will then undergo eddy current separation (where different material separated based on relative weight) and collected for further processes, before precious materials (see Plates 2.7, Plate 2.8 and Plate 2.9) as final output are recovered.

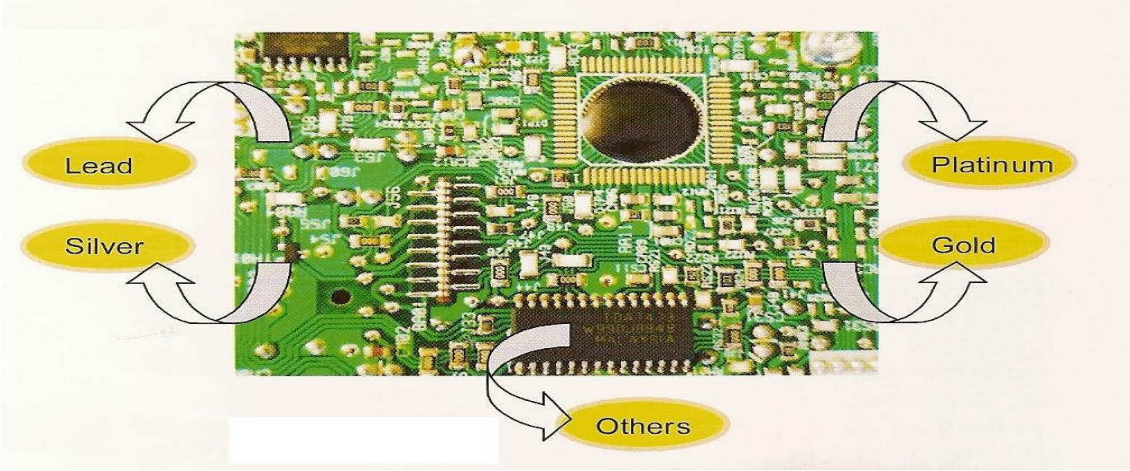



Plate 2.3: A printed circuit board of a used computer and the precious materials that can be recovered from it. (Source: Theng 2006)


Plate 2.4: Coarsely crushed printed circuit boards. (Source: author - courtesy of Tes-Amm (M) Sdn. Bhd.)


Plate 2.5: Medium crushed printed circuit boards. (Source: author - courtesy of Tes-Amm (M) Sdn. Bhd.)


Plate 2.6: Fine crushed printed circuit boards is ready for eddy current separation process. (Source: author - courtesy of Tes-Amm (M) Sdn. Bhd.)

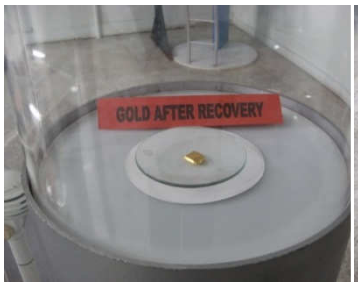



Plate 2.7: Gold after the recovery process. (Source: author - courtesy of Tes-Amm (M) Sdn. Bhd.)


Plate 2.8: Silver after recovery. (Source: author - courtesy of Tes-Amm (M) Sdn. Bhd.)


Plate 2.9: Recovered copper from e-waste. (Source: author - courtesy of Tes-Amm (M) Sdn. Bhd.)

Recycling can recover up to 95% of useful materials from a computer and 45% of materials from cathode ray tube (CRT) monitors (Ladou and Lovegrove 2008). Other than recovering valuable materials from e-waste, recycling also contributes to significant energy savings, as mining of virgin materials can be

avoided. Table 2.6 shows the different percentage of energy than can be saved by recycling of materials.

Table 2.6: The percentages of energy savings from the recycling and recovery of different materials in e-waste

| **Material** | **Energy savings (%)** |
|---|---|
| Aluminium | 95 |
| Copper | 85 |
| Iron and steel | 74 |
| Lead | 65 |
| Zinc | 60 |
| Paper | 64 |
| Plastic | >80 |

Source: Cui and Forssberg (2003)

E-waste recycling operations in more economically developed countries are carried out formally and initiated by a high level of awareness of environmental protection. In countries like Japan, the USA and Switzerland, recycling operations are carried out using modern techniques (as described above) and produce very little environmental impact (Aizawa et al. 2008, Andreola et al. 2007). This process involves advanced technology and huge financial cost. For example, Jain (2008) quoted that a study by the USA Environmental Protection Agency has shown that the cost of e-waste recycling in USA is ten times more expensive than in Asia. The significant difference in the recycling cost in USA and Asia is due to the different level of technology involved. E-waste recycling in less economically developed countries such as in China (Eugster and Fu 2004) and India (Sinha 2008, Rochat et al. 2008, Streicher-Porte et al. 2005,) is often carried out in the informal sector, where extraction of copper, lead, gold and silver are done crudely, (including manual dismantling of components, wet chemical processing such as immersing in

sulphuric and nitric acid solutions, and incineration) (Sarkar 2008), which poses significant environment and health effects.

In India for example, e-waste recycling is conducted predominantly by informal private companies or individuals. The common flow of e-waste recycling process in India is presented in Figure 2.4.

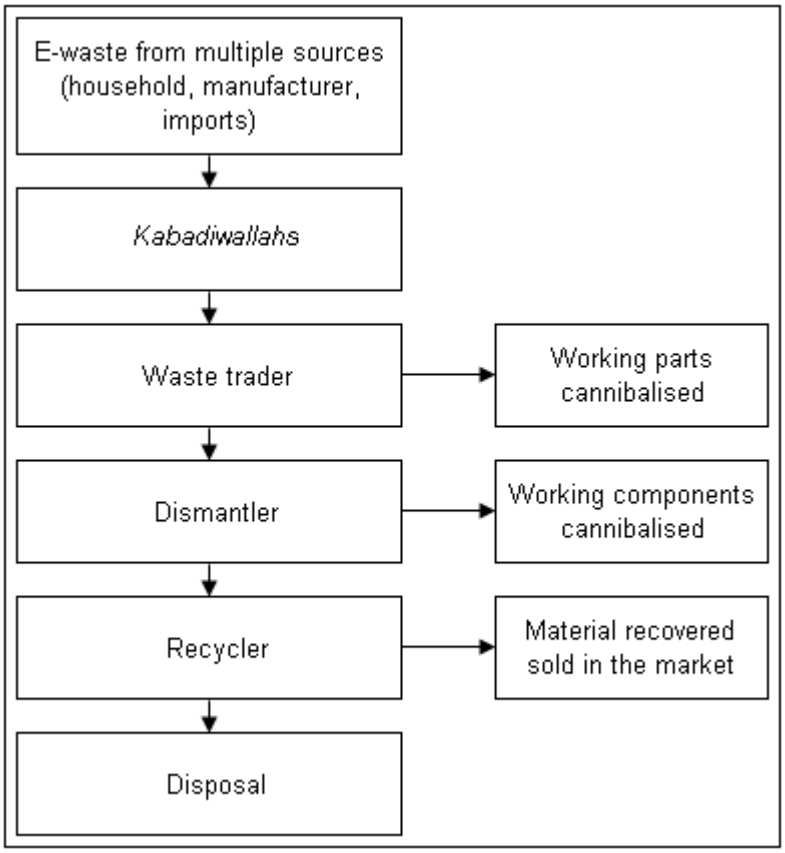



Figure 2.4: Sequence of events in a recycling chain in India

The e-waste recycling chain in India begins with the collection process by individual waste dealers which are locally known as *kabadiwallahs* (Sinha 2008). *Kabadiwallahs* collect not only e-waste but all types of recyclable items from multiple sources and sell them to large waste dealers or traders. The waste traders then segregate the waste according to type. E-waste is cannibalized for usable parts which are sent back to market for reuse (Sinha

2008). The waste is then sold to the dismantlers who will further dismantle each component and salvage the usable components like integrated circuits (ICs), capacitors and so on. These dismantlers are finally linked to the recyclers, who are interested in specific components and are engaged in final material recovery.

The process of recovery of precious material from printed circuit boards in a formal environmentally sound recycling plant, as discussed above, involves repeated crushing and eddy current separation (which is done mechanically) before metals are recovered. However in India, the process of metals recovery from printed circuit boards is carried out either by open burning or acid bath (Sinha 2008). Processing through the acid bath method requires the printed circuit boards be dipped in a solution of hydrochloric acid for a few hours, before being boiled with caustic soda solution. It is then manually scrubbed by bare hands to remove the paint, and dipped in acid solution (a combination of nitric and sulphuric acid) for a few hours. The reaction of acid and copper formed copper sulphate (in form of sludge), which is then drained from the acid (and copper is recovered) while the acid solution is thrown into nearby river or land. The metals extracted are usually sold to smelters who purify the metals and sell them in the market for reuse.

As will be clear, the activities as described above pose an extreme health hazard to the worker, (and other people) and a significant risk to the environment. Other computer components and their related health and environmental hazards are listed in Table 2.7. From a socio-economic perspective, the activities in this chain are responsible for providing livelihoods to a significant number of urban poor. The system also plays an important role in managing the huge amount of e-waste which is not only domestically generated, but also imported from more economically developed countries, which would otherwise been sent to the landfill. The following sub-section discusses the movement of e-waste from the more economically developed

countries to the less economically developed countries and its implications, in more detail.

Table 2.7: Potential occupational and environmental hazards in recycling process of computers

| **Computer Component** | **Potential health and occupational hazard** | **Potential environmental hazard** |
|---|---|---|
| Cathode ray tubes (CRT)/ Monitors | • Silicosis, cut injury, inhalation or direct contact with phosphor containing cadmium and other metals such as lead and mercury | • Release of lead, mercury, barium, toxic phosphor and other heavy metals into water and soil |
| Printed circuit boards | • Inhalation of tin, lead, dioxin, beryllium, cadmium, mercury | • Air emission of metals and dioxins |
| Dismantled printed circuit boards | • Inhalation of tin, lead, dioxin, beryllium, cadmium, mercury and respiratory irritation | • Tin and lead contamination of soil and water.<br>• Emission of brominated dioxin, beryllium, mercury and cadmium. |
| Chips and other related components | • Corrosive injury to eye and skin, inhalation of acid fumes and harmful gases such as chlorine and sulphur dioxide | • Water and soil contamination and air emission of hydrocarbons, heavy metals, halogenated substances and acids. |
| Plastics from computers and peripherals | • Direct contact and inhalation of hydrocarbons, dioxin, and heavy metal | • Emissions of dioxins and heavy metals and hydrocarbons |
| Wires and cables | • Inhalation of brominated | • Emissions of brominated |

| Computer Component | Potential health and occupational hazard | Potential environmental hazard |
|---|---|---|
| | and chlorinated dioxin, and polycyclic aromatic hydrocarbons (PAHs) | and chlorinated dioxin, PAHs |
| Miscellaneous computer parts enveloped in rubber | • Inhalation of dioxins and PAHs | • Emission of dioxins, PAHs |
| Toner cartridges | • Respiratory irritation, unknown carcinogenic impact of carbon black, cyan, yellow and magenta toners | • Soil and water pollution |
| Secondary steel, copper and precious metal smelting | • Heat injury, inhalation of dioxins and heavy metals | • Emissions of dioxins and heavy metals |

Source: Adapted from Puckett et al. 2002

### 2.4.2 Transboundary Movement of E-waste

Transboundary movement of e-waste is regulated under the Basel Convention. The Basel Convention was negotiated in the late 1980s under the auspices of the United Nations Environmental Programme (UNEP) due to the growing global environmental concern of the adverse effects of hazardous waste (Basel Convention website at www.basel.int). One of the aims of this convention is to curb illegal shipping and trading of hazardous waste from the OECD (Organisation for Economic Co-operation and Development) countries to non-OECD countries, as a way to prevent dumping of hazardous waste, and to avoid the negative impacts from treating and disposing of hazardous waste in

the less economically developed countries. It was adopted in 1989 and entered into force in 1992; and as of December 2010, 175 countries have signed to become members of this convention (Basel Convention website at www.basel.int).

The Basel Convention is built on two basic principles; 'Prior Informed Consent' and 'Environmentally Sound Manner' (ESM). This is apparent in the provision on import and export of e-waste, where written consent from the transit and the receiving states, and proof that the waste is treated in an 'Environmentally Sound Management (ESM)' manner must be provided to the related authorities before permission to import and export can be granted (Levinson et al. 2008). Despite these restrictions, e-waste is still being traded between countries in the Global North and the Global South (often illegally) (see for example Nnorom and Osibanjo 2008, Puckett 2005, Streicher-Porte et al. 2005, Widmer et al. 2005, and Puckett et al. 2002) mainly for two reasons; firstly, to be recycled in the less economically developed countries at a lower (financial) cost and secondly, to be donated to the relatively poorer population in the Global South as a way to 'bridge the digital divide' (Nnorom and Osibanjo 2008: 1474).

There have been several attempts by numerous researchers to analyse the reasons for the wide spreading of transboundary e-waste movement despite the availability of an international treaty to overcome the problem. For example, Streicher-Porte et al. (2005) and Widmer et al. (2005) relate the problem of transboundary movement of e-waste to the lack of national regulation and weak enforcement of law in member countries; while Lepawsky and McNabb (2010) relate the issue to the loopholes in the treaty itself. Lepawsky and McNabb (2010) identify three gaps in Basel Convention: first, contradiction in the definition of hazardous waste in the national laws of member countries; second, unclear definition of the term 'environmentally sound manner'; and

third, allowance for transboundary movement of e-waste for reuse or recovery through recycling.

The economic attraction of e-waste recycling is the pulling factor behind the huge demand for e-waste in many less economically developed countries - despite its environmental and health hazard - which has led to the export of a significant but undetermined volume of e-waste into these countries, from the more economically developed countries (Robinson 2009). The loopholes in Basel Convention (which allows transboundary movement of e-waste for recycling) has led to the problems of some irresponsible exporters 're-categorising' all exported e-waste as intended for recycling (Lepawsky and McNabb 2010: 179). For example, Schmidt (2006) estimates that 80% of collected e-waste in the Global North is exported to Asia, and 70% to 90% of this goes to China (Liu et al. 2006, Puckett et al. 2002), while significant quantities are also exported to India, Pakistan, Vietnam, the Philippines, Malaysia, Nigeria and Ghana (Puckett 2005) and possibly to Brazil and Mexico (Robinson 2009). Figure 2.5 shows the main e-waste recycling countries, the main ports involved and the flow of e-waste movements.


Source: Rekacewicz (2002) http://maps.grida.no/go/graphic/who-gets-the-trash

Figure 2.5: The main e-waste recycling countries, main e-waste receiving ports and the movement of e-waste

The activities of handling, transporting, trading, possessing and disposal of hazardous waste and resources which contravene to the national law (of any country) or the international law are considered as pollution crime (INTERPOL website, available at http://www.interpol.int). As transboundary movement of e-waste involved international level crime, intervention of INTERPOL is seen as a way to overcome the problem. INTERPOL became actively involved in fighting pollution crime since 1992, when Pollution Crime Working Group was established (INTERPOL website, available at http://www.interpol.int). The scope and remit of INTERPOL Pollution Crime Working Group, as in other INTERPOL actions, is limited within the laws of individual countries and in 'the spirit of the Universal Declaration of Human Rights' and avoiding 'any intervention or activities of a political, military, religious or racial character' (INTERPOL website, available at http://www.interpol.int).

Research conducted by Bureau Veritas in the UK and Michigan State University in the USA (on behalf of the INTERPOL Pollution Crime Working Group (PCWG)) has revealed that the largest volume of cathode ray tube (CRT) monitors which were exported from the USA in the year 2007 is destined for Malaysia (INTERPOL Pollution Crime Working Group (Phase II) Report 2009). According to the report, USA exported 50.7 metric tonnes or 72% from the total exported CRTs to Malaysia (see Table 2.8 for the volume and percentage of exported CRTs from USA to other countries). Although this amount seems huge, it could be under-estimated as the data (which were obtained from the USA Environmental Protection Agency (EPA) in 2007) were based on self-reporting system. The actual amount could possibly be much higher.

Table 2.8: Estimated export volume of CRTs from the USA in 2007

| **Countries** | **Volume (metric tonnes)** | **Percentage (approximate)** |
|---|---|---|
| Canada | 11.6 | 16 |
| Malaysia | 50.7 | 72 |
| Brazil | 1.0 | 1 |
| Korea | 7.1 | 10 |
| TOTAL | 70.4 | 99 (not 100%, due to rounding) |

Source: adapted from the INTERPOL Pollution Crime Working Group (Phase II) Report 2009

The movement of e-waste from more developed western countries to the less developed countries in Africa and Asia could bring two environment implications; first, leakage of hazardous substances during its transportation and second, unsustainable processes of material recovery and recycling. The processes of material recovery, especially those practised by the informal sector in less economically developed countries are often not undertaken in an environmentally sound manner and may lead to the leakage of hazardous substances. In China, Qiu et al. (2005, in Zhang 2009) argues that the negative health effects of workers in the e-waste recycling and recovery industry are higher compared to workers in other industries by these percentages; headache (47.7%), itch (15%), nausea (11.1%), insomnia (9.7%), hypomnesia (5.3%) and conjunctiva congestion (4.8%).

Besides being traded for recycling purpose, used electrical and electronic equipment are also exported to many developing countries as donations, especially computers (Robinson 2009), often in the name of 'bridging the digital divide' (Nnorom and Osibanjo 2008). A study by Basel Action Network (BAN) in Nigeria revealed that there are huge amounts of used electrical and

electronic equipment especially computers being imported into Nigeria for donation or second hand use every year (Puckett 2005). Based on the tags on the imported appliances and the information on the computer hard drives, they found that 45% of the computers are from the EU, 45% from the USA and the remaining 10% are from other countries such as Japan, Belgium, Finland, Israel, Germany, Italy, Korea, Netherlands, Norway and Singapore (Puckett 2005). These equipment - which are considered obsolete in the more technology advanced donor countries - will quickly become obsolete and turned into e-waste in the recipient country, hence contributing to the increase in e-waste generation in those countries. Thus, the donation of electrical and electronic equipment from the more economically developed countries to the less economically developed countries is seen as an easy way for unscrupulous parties to dispose of their e-waste (Robinson 2009, Nnorom and Osibanjo 2008). As there is no specific provision on movement of e-waste for donation in the Basel Convention, it is not considered as an illegal activity (Ladou and Lovegrove 2008). However, it is timely that Basel Convention legislate a provision to tackle the issue of 'donating as a guise of dumping' in managing transboundary e-waste movement. One way this could be done is by making it mandatory for the donor countries to be responsible for the disposal of the donated item; for example all donor countries or organisations are required to submit a plan for treatment and disposal of the donated items (once they reach their end-of-life) to the related authority in the donor and recipient countries, before approval for export can be granted.

## 2.5 E-waste Management in Malaysia

Malaysia is facing significant challenges related to the rapid increase in the volume of e-waste in the country which is coming from two main sources; domestically generated and imported e-waste. As mentioned in Section 1.2, Malaysia generated 688,000 metric tonnes of e-waste in 2008 (E-waste Inventory Project in Malaysia Report 2009). This data was obtained from

surveys involving 1200 respondents from diversified segments of the society including households, business entities, institutions, e-waste recyclers, electrical and electronic equipment manufacturers, importers and exporters in eleven main cities in the country, based on seven types of most common e-wastes – i.e. television sets, personal computers, mobile phones, refrigerators, air conditioner units, washing machines and rechargeable batteries (E-waste Inventory Project in Malaysia Report 2009). This volume of e-waste is expected to rise up to 1.1 million metric tonnes in 2020, at a rate of 14% annually, according to the same report. The electrical and electronic items which have contributed significantly to the volume of e-waste in Malaysia are television sets and mobile phones. The huge volume of discarded television sets might be due to Malaysian government's announcement to move into digital era and will switch off the analogue era by 2015 (Malaysian Communications and Multimedia Commission, as reported in The Star, 1 April 2009).

Besides the increasing amount of locally generated e-waste, Malaysia is also exposed to the e-waste trading or smuggling activities due to its location in the middle of the e-waste movement route (see Figure 2.5). The increasing amount of e-waste generated in Malaysia, coupled with the high possibilities of e-waste being imported from other countries demand for a proper e-waste management framework is put in place especially as there are evidence of indiscriminate dumping and improper disposal of e-waste (see Section 5.1), thus resulting in the introduction of the first e-waste law – the Environmental Quality (Scheduled Wastes) Regulations 2005 – in August 2005. Similar to many other countries, e-waste management strategy adopted in Malaysia is focused on recycling and material recovery processes. As such, the enforcement of Environmental Quality (Scheduled Wastes) Regulations 2005 includes the control of recycling facilities/premises through a licensing system. As of July 2010, there are 138 licensed recycling premises throughout the

country, with the breakdown between types of premises and its distribution among states as in Table 2.9 below.

Table 2.9: The number and distribution of e-waste recovery premises in Malaysia

| **State** | **Partial Recovery Premises** | **Full Recovery Premises** |
|---|---|---|
| Johor | 17 | 3 |
| Kedah | 12 | 1 |
| Melaka | 12 | 3 |
| Negeri Sembilan | 5 | 1 |
| Perak | 4 | 0 |
| Pulau Pinang (Penang) | 37 | 6 |
| Sarawak | 5 | 0 |
| Selangor | 25 | 2 |
| Wilayah Persekutuan | 5 | 0 |
| Total | 122 | 16 |

All these premises are operated by private companies. These recycling companies collect e-waste from non-householders (such as industries and large institutions) based on yearly contract; as such these companies are also known as ‘e-waste contractors’. Out of 138 e-waste recycling companies (as at July 2010), 122 companies are involved in partial recovery which refers to the process of collecting, segregating, dismantling and crushing of the equipment, (where the recovered materials will need further treatment before final products are produced); while the remaining 16 companies are involved in full recovery process which refers to the complete chain of processes starting from dismantling of e-waste and recovery of precious metals, up to final disposal of treated hazardous. Plate 2.10 shows the computer dismantling process in one of

the full recovery premises. The technology employed by material recovery premises in Malaysia to recover precious metals from e-waste is limited to wet chemical processes and electrolysis (Awang 2010). Several different pieces of machinery used in the process are shown in Plate 2.12 and Plate 2.13.

Plate 2.10: Dismantling of used computer at a recycling company in Malaysia. (Source: Reclaimtek (M) Sdn. Bhd.)

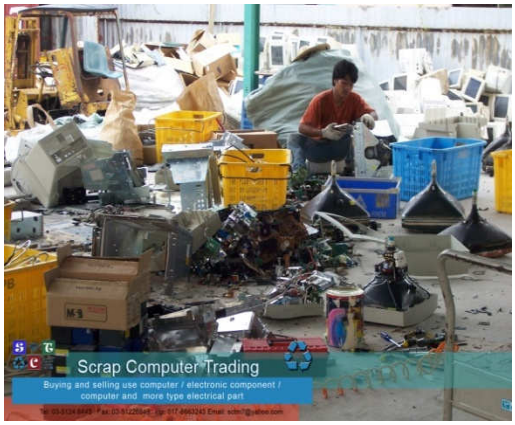



Plate 2.11: A worker is engaged in manual dismantling of a used computer. (Source: Scrap Computer Trading)

Plate 2.12: A crusher plant. (Source: Reclaimtek (M) Sdn. Bhd.)

Plate 2.13: An e-waste recovery plant. (Source: Reclaimtek (M) Sdn. Bhd.)

While the e-waste generated, imported and processed by the non-householders in Malaysia (which include all industries, institutions and business entities) is regulated and controlled by law provision, there is no formal or institutionalized system of managing household generated e-waste. More over, the government does not provide facilities for proper disposal of e-waste. The issue of lack of formal system of management and disposal facilities, coupled with the low level of awareness among the society have resulted in improper disposal of e-waste, where small-sized e-waste (such as mobile phones and batteries) are disposed of together with normal household waste and ended up in landfill, and bulky items (such as refrigerators, computers, television sets) are being dumped indiscriminately, while some items are sold to door-to-door scrap buyers/dealers who are not licensed to collect and treat e-waste. Although the amount of e-waste disposed of by each member of the society may be small, it has tremendous cumulative and collective effects. The flow of e-waste in this manner exposes the society to environmental and health hazard. The failure of the government of Malaysia to provide a proper mechanism of e-waste management, has triggered some concerned non-government stakeholders to step in and work together with the government to provide a better system of e-waste collection from the society, such as initiating voluntary take-back schemes (refer Chapter 6 and Chapter 7). However, these initiatives of societal steering for proper disposal of e-waste are not widespread nationwide, and only concentrated in several major towns. As such, the Malaysian government and related non-government stakeholders are working together towards introducing a relevant take-back law to control the negative environmental and health effect of improper household e-waste disposal (refer Section 5.2.4).

In relation to e-waste recycling and material recovery activities, Malaysia faces the challenge of tracking down unlicensed/ illegal operators, as many of them operate from backyards of houses or shop houses, normally in secluded areas, and often in the pretext of other legal business such as buying and selling of

non-hazardous waste. These operators (mainly involved in partial recovery activities) conduct recycling and recovery activities of e-waste in an unsafe and unsound manner. For example in Plate 2.11, computer parts and components are left lying around on the floor, posing the danger of accident to the workers. In Plate 2.14 and Plate 2.15, obsolete computers which are waiting to be processed are left in the open air, exposing it to leakage of hazardous substances to the soil and groundwater. In addition to that, Plate 2.16 and Plate 2.17 show a huge amount of dismantled e-waste components left under unprotected area, which is also posing significant health and environmental should the hazardous substances leak into the environment.


Plate 2.14: Piles of obsolete computers at a recycling company in Malaysia. (Source: Scrap Computer Trading)


Plate 2.15: Dismantled computers awaiting further processing. (Source: Scrap Computer Trading)


Plate 2.16: E-waste components. (Source: Scrap Computer Trading)

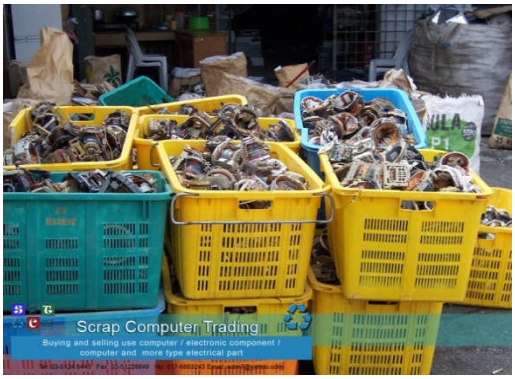



Plate 2.17: Dismantled components of e-waste. (Source: Scrap Computer Trading)

There is no record to date on accidents of environmental problems due to environmentally unsound process of recycling or material recovery of e-waste in Malaysia (E-waste Inventory Project in Malaysia Report 2009). Though

anecdotal accounts, including a report in the local newspaper (The Malay Mail, April 2005), suggest that such health hazards are experienced, including severe skin damage from exposure to acids in an e-waste recycling facility (E-waste Inventory Project in Malaysia Report 2009).

As a conclusion, e-waste management in Malaysia is targeted towards the middle of the waste management hierarchy with a strong emphasis of recycling and material recovery processes to avoid disposal, and has so far shown no attempt to achieve the most desirable option in waste management triangle (i.e. prevention of e-waste generation). To ensure that the process of e-waste recycling and material recovery are conducted in an environmental sound manner with minimal impacts to the environment and society, Malaysian government imposed a law (Environmental Quality (Scheduled Wastes) Regulations 2005) which controls the treatment of non-household e-waste which is sourced domestically (from industries, business entities and institutions) and abroad (from legal imports), while the management of locally generated household e-waste is shared with several non-governmental stakeholders. Several main problems related to e-waste recycling and material recovery management strategy adopted in Malaysia includes; the influx of illegal import or smuggling of e-waste due to ineffective enforcement of law; rapid growth of locally generated e-waste due to the lack of prevention and minimization strategies; indiscriminate dumping and improper disposal of e-waste due to lack of facilities provided and low awareness among the society; and tracking down illegal e-waste recycling operators.

## 2.6 Conclusion

The issue of sustainable waste management is becoming more challenging with the emergence of a relatively new type of waste in the waste stream; the e-waste. E-waste is a contemporary environmental issue due to its rapid growth in volume and its hazardous content. Despite its hazardous potential, e-waste contains considerable amounts of precious materials which provide a profitable business opportunity. Thus, for both environmental and economic reasons, many countries worldwide adopt recycling and material recovery strategy to manage e-waste.

The economic value of e-waste has induced the proliferation of illegal export or smuggling of e-waste especially from the countries in Global North to the countries in the Global South, where precious metals can be recovered from e-waste at cheaper cost. One particular country in the Asian region which adopts recycling and material recovery strategy as an option to manage e-waste is Malaysia. As mentioned in Section 2.5, main issues relating to adoption of this waste management option in Malaysia includes illegal import or smuggling of e-waste, rapid growth of locally generated e-waste, indiscriminate dumping and improper disposal of e-waste, and tracking down illegal e-waste recycling operators. These call for a strong cooperation of government and non-governmental stakeholders to govern this environmental issue together, as traditional governing by the government alone has proved (refer Chapter 5, 6 and 7) to be too challenging for the government.

Recycling practices in Asian and African countries are mainly based on economic potential. In these countries, e-waste is treated as just another type of recyclable item and the process is characteristically undertaken without proper environmental procedures, often by illegal recycling operators who operate informally outside of the main business circle. This has brought many consequences such as high occupational health risks to the workers due to the

exposure to hazardous materials, and negative impact on the environment and the society at large as a result of the inappropriate disposal of hazardous materials from the recycling and material recovery processes. From the resource conservation perspective, such informal practices are ineffective as the percentage of recovery is low and many of the valuable materials are lost during the inefficient recovery processes. It is thus obvious that leaving the recycling of e-waste to the informal sector is not a sustainable option, both environmentally and economically.

Although e-waste recycling practices in the more economically developed countries appear to be more technologically advanced and environmentally sound compared to those in the less economically developed countries, they still pose environmental and health threats as it is impossible to recycle e-waste without any environmental impacts (Hischier et al. 2005). Recycling process may remove some contaminants, but some amount of hazardous substances may still be concentrated at e-waste recycling centres (Robinson 2009). However, e-waste recycling and material recovery management strategy have a relatively lower environmental impact compared to disposal (through landfill or incinerator) management option (Hischier et al. 2005). However, all stakeholders of e-waste management, from the government and non-governmental sectors worldwide should consider shifting the management options towards the top of the waste management hierarchy (prevention and waste minimization) by substituting the hazardous materials in e-waste with non-hazardous materials (as pioneered by the EU with the enforcement of RoHS directive in 2003) and encouraging redesign of equipment (which facilitates replacements of parts of equipment to cope with technology advancement instead of disposing items in whole) for a better control of the negative impacts of e-waste.

## Chapter 3: The Conceptuality of E-waste Governance

### 3.1 Introduction

The term ‘governance’ is defined in many ways and has been used in different contexts. Because of its extensive application, the term ‘governance’ receives diverse interpretations; making it a highly contested term. Nevertheless, in this research a broad definition is adopted within which it is understood as ‘a process of guiding, directing or steering of society’ (Jordan et al. 2005: 479). Based on this definition of governance, this chapter seeks to understand the governance concept and its application within the specific fields of environmental policy and waste management. While much of the debate on governance has originated outside the environmental sphere, there is a growing interest in the concept within the field of environmental policy and waste management. The challenge for governance analysts in analyzing environmental issues is to facilitate deeper understanding of the governance approaches, whilst preserving the broad concept of governance (Jordan et al. 2005, Eberlein and Kerwer 2004).

At the centre of the debates on governance is the proposition of a shift from government to governance, which is related to the shift on perception on the relation between society and economy (Jessop 1997). Section 3.2 provides an overview of this debate and a detail account of the main characteristics of governance; which are the multiplicity of levels, actors and modes of governance. One question which is of interest to governance analysts is the ability of nation states and non-state actors to practice governance in an increasingly complex world (Kjær 2004, van Kersbergen and van Waarden 2004). Thus, it is the aim of this chapter to seek the answer to this question based on analysis on environmental governance from the perspective of multiple levels, actors and modes of governance. Modes of governance in this thesis is understood as the mechanism to achieve governance, and is divided

into four types, namely; hierarchical, persuasion, self-governance and co-governance mode. A stronger emphasis is given here to the analysis of modes of governance as it is intricately linked to other perspective of governance such as multiple levels and actors of governance. For example, a multiple modes perspective on environmental governance allows for a deeper understanding of the roles of different actors, as actors behave differently in different modes of governance. A detailed account of the applications of multiple levels, actors and modes of governance perspectives in the analysis of environmental governance are discussed in Section 3.3. Discussions are based on literatures on case studies from the Global North and Global South, mostly related to current significant environmental issues such as pollution, climate change and waste management. Taken together, this chapter is wrapped up with a conclusion in Section 3.4 which states that the multiplicity perspective of governance offers an avenue to examine the intricate, complex and sometimes overlapping relations of multiple levels, actors and modes of governance for a holistic and comprehensive understanding of e-waste governance in Malaysia.

## 3.2 Governance: Definition and Transition of Interpretation

One way governance is understood is as a process of steering of societies by state and non-state actors. It is defined by Kooiman (1993) as 'the patterns that emerge from the governing activities' (Kooiman 1993: 2); while governing activities is defined as 'purposeful effort to guide, steer, control or manage (sectors or facets of) societies' (Kooiman 1993: 2). Governing activities have shifted from the 'rowing' actions of government through the 'formal public sector agencies' and 'bureaucratic procedures' (Davoudi and Evans 2005: 495) to 'steering' actions where directing is provided without force or sanction. The concept of governance describes a range of processes and practices that signifies 'dispersion' of decision making authority away from central government (Hooghe and Marks 2003: 233), and introduces 'new' modes of governing alongside traditional hierarchical mode.

The shift from government to governance has been a topic of debate in various fields in social science. There are scholars who relate the shift to the introduction of the of neoliberal policy after the 1980s which resulted in the rolling back of state activities in service delivery (see Thornley 1993), while others argue that the shift is due to the socio-economic change which is apparent in the move from Keynesian welfare state to post-Fordist flexible specialisation (see Jessop 1995). De Angelis (2003) relates the shift to the massive growth of civil society organizations (CSOs) which have influenced the decision making process. Although the line separating the shift from government to governance is blurry, Jessop's (1997) argument that the central issue behind the shift from government to governance is the restructuring of state's role in governing the interaction between societies and economy captures the essence of the debate.

Based on the arguments above, governance can be regarded as a complex arrangement where the ability to govern does not rely exclusively on the authority, legitimacy and sanctions of governments (Hysing 2009, De Angelis 2003), but is shared with non-state actors with the application of 'new' modes of governance. Two dimensions of governance debate which have received sustained attention are regarding power and democracy (and legitimacy). Power has always been in the forefront of governance analyses; particularly regarding the power and authority of nation state. Questions arose about whether the power of the nation state has been eroded in the shift from government to governance, and the consequences of this shift. There are several camps of thoughts about this. Several governance analysts (such as Macleod and Goodwin 1999, Rhodes 1997, and Jessop 1994) argue that there has been a hollowing out of the nation state, as functions of the nation state are dispersed beyond national boundaries and to non-state actors; while on the other extreme Bell et al (2010) argues that the role of states is strengthened in the governance process. The views of others, such as Pierre (2000),

Karkkainen (2004) and Rosenau and Durfee (1999) stand in the middle of these two extremes. For example, Pierre (2000) argues that state's authority is being 'transformed' rather than decline in governance process, while Karkkainen (2004), and Rosenau and Durfee (1999) suggest that governance resulted in lack of dominance of state actors, but not to the extent of hollowing it out.

The second concern is regarding democracy and legitimacy in governance, which is a controversial issue and has caused disagreement among governance scholars. One of the underlying expectations of governance is to increase the level of democracy and legitimacy in decision-making process with the inclusion of non-state actors (Trubek and Trubek 2005, Kjær 2004, Stoker 2000). However, this is criticized by a few scholars (see Bell et al. 2010, Bell and Hindmoor 2009, Steffek and Smismans 2008, Smismans 2006) who argue that democracy in decision making is only achievable if the governance actors are selected through a democratic process. Therefore, the participation of non-state actors in governance process is not an indication of democracy. Futhermore, according to Newman (2001) governance is having lack of legitimacy and integrity from the legal dimension due to the involvement of non-state actors in policy formation and implementation, as the legitimacy of some non-state actors such as NGOs are under question. Despite the critiques and disagreements among scholars, there is a degree of agreement about the features which governance is said to exhibit which is the multiplicity of levels, actors and modes of governance. This is discussed in the following section.

### 3.2.1 The Multiple Levels and Actors of Governance

The multiple levels perspective of governance revolves around the idea of power distribution among the various levels of authority (Jordan and Schout 2005, Klooster 2005, Bulkeley and Betsill 2003, Hooghe and Marks 2003). The concept of sharing of governing power between tiers of authority was originally conceived as a basis for the analysis of transitions within processes of decision making within the European Union (Jordan 2001, Hooghe and Marks 1996), but has since been applied elsewhere (Betsill and Bulkeley 2006). The emergence of regional forms of government (like EU) has seen that trickle-down of power has expanded beyond a sovereign state (Hooghe and Marks 2003). Drawing on the works of Betsill and Bulkeley (2006) and Hooghe and Marks (2003), the dispersion of authority in new governance can be categorized into two directions: vertically, where governance takes place within the multiple tiers of government, known as 'Type I' governance by Hooghe and Marks (2003: 256), or multiple 'tiers' of authority by Betsill and Bulkeley (2006: 150); and horizontally, where governance happens between multiple governance actors, known as 'Type II' governance by Hooghe and Marks (2003: 256) or multiple 'spheres' of authority by Betsill and Bulkeley (2006: 150).

Another characteristic of governance is the inclusion of non-state actors (Sørensen 2006, Davoudi and Evans 2005). The term 'non-state actor' is amorphous and has been defined in numerous ways (Schwartz 2004). In this thesis, however, the term is used to refer to actors in the governance process which are independent from the state and are legally registered. The literature on the role of multiple actors in governance is rapidly increasing, though three main strands can be discerned. The first strand takes the state-centric perspective and focuses on the importance of the state's roles in new governance (see Schout et al. 2010, Bell et al. 2010, Bell and Hindmoor 2009, Scott 2009, Hysing 2009, Trubek and Trubek 2005, Jordan et al. 2003,

Fairbrass and Jordan 2002); the second strand is based on society-centric view and focuses on the roles of non-state actors (see Shi and Zhang 2006, Ahmed and Ali 2006, Davoudi and Evans 2005, Schwartz 2004, Rhodes 1997, Appadurai 1996); while the third strand steers in the middle of the two extremes (see Davies 2008, Karkkainen 2004, Rosenau and Durfee 1999).

### 3.2.2 The Multiple Modes of Governance

Another distinctive characteristic of governance is its 'new' modes of governance. Many governance scholars (see Sørensen and Torfing 2009, Dinica and Bressers 2004, Kooiman 2003) stress the importance of understanding the different type, qualities and capacities of modes of governance, in designing the best governance mode option as it is very rare for today's society which is more complex and diverse to be governed by one mode. The multiplicity of the modes of governance has been studied from many perspectives. Although the work concerning modes of governance is abundant, there is 'little consensus on what a mode of governance entails' (Bulkeley et al. 2007: 2736). In this thesis, 'mode' of governance is understood as a mechanism in which governance is achieved.

Bell and Hindmoor (2009), study modes of governance from perspective of state-centric relational approach to governance, and identify five different modes; hierarchy, persuasion, markets, community engagement, associations. While Kooiman (2003) examines modes of governance from social-political approach (a society-centric approach) and identifies three modes: hierarchy, co-governance and self-governance. Further analysis of these two studies reveals that there are similar modes which are given different labels by different scholars. For example the associations mode discussed by Bell and Hindmoor (2009) is conceptually similar to what Kooiman (2003) addressed as co-governance; and community engagement mode (in Bell and Hindmoor 2009) has many similarities with a governance mode which is labeled as self-

governance by Kooiman (2003). Some elements of self-governance as discussed by Kooiman (2003) - such as deregulation and privatisation- is described in Bell and Hindmoor (2009) under the label of 'governance through markets'. Based on the combination of the works of Bell and Hindmoor (2009) and Kooiman (2003) (which are based on contrasting perspectives), this thesis indentifies four types of governance modes; hierarchy, persuasion, self-governance and co- governance.

***The Hierarchical Mode of Governance***

The first governance mode (identified by both Bell and Hindmoor (2009) and Kooiman (2003)) is hierarchical governance. Hierarchical governance is characterized by top-down control, where governing entities determine how policy should be conducted and implemented to achieve some preferred end point in a given situation (Bell and Hindmoor 2009, Jordan 2008, Kooiman 2003). In this conventional mode of governance, the behaviour of other participating actors is influenced by governing authorities in a formal and vertical structure, often with sanctions (Kooiman 2003). Two important concepts identified by Kooiman in hierarchical governance are steering and control. Hierarchical mode of governance is closely related to the implementation of neoliberal agenda, such as the implementation of 'good governance' concept, which deals with issues of efficient, accountable and transparent delivery of public services (Jordan 2008, Hezri and Dovers 2006).

***The Persuasion Mode of Governance***

The second mode is the persuasion mode. This mode is identified in Bell and Hindmoor (2009), but not mentioned in Kooiman (2003). Bell et al. (2010), and Bell and Hindmoor (2009) define persuasion as a mode of governance where actors of governance seek to change two things in the society that is being governed - the behaviour of members of the society, and mindset of the

members regarding how they ought to behave – in order to achieve specific policy objectives. There are numerous examples of how governments have applied this mode of governance; from the French government's campaign to increase birth rates after the World War I to current examples on wider health and environment-related issues in Australia, the United Kingdom and Canada (Bell et al. 2010). Although most of the examples in the literature are drawn from the Global North, persuasion as a governance mode is also applied in countries in the Global South.

***The Self-governance Mode***

The third mode is self-governance. According to Kooiman (2003), self governance refers to the capacity of social entities to govern themselves autonomously. Kooiman and Jentoft (2009) defined self-governance as 'the situation in which actors take care of themselves, outside the purview of government' (Kooiman and Jentoft 2009: 821). Interest in self governance as a mode of governance began with the trend towards withdrawing public interventions by means of deregulation or privatisation in the 1980s. Its emergence is due to two reasons; firstly in search of ways to strengthen self-steering capacity of the society, and secondly in search for other actors of governance other than the state, in certain areas where the state cannot fulfill its governing promises (Kooiman 2003). Kooiman (2003) cites the governance of powerful professional bodies such as the legal and medical professionals as examples of application of the self governance mode. These bodies formulate and enact their own rules to the exclusion of outsiders. Self-governing is sometimes seen as operating under the shadow of the state actors, as sectors of society can only govern themselves if they are allowed to do so by the government (Kooiman and Jentoft 2009); however, as self-governance is not created by the government, it is considered as a type of governance mode.

***The Co-governance Mode***

The fourth mode, co-governance, is one of the most prominent defining characteristic of the 'new' governance (Leach and Percy-Smith 2001). Kooiman identifies five major manifestations of co-governance: communicative governance, co-management, regimes, public-private partnerships (PPP), and networks, which are conceptualized differently depending on the disciplines dealing with them. One type of co-governance mode that warrants detailed discussion here is PPP for two reasons. Firstly, its extensive application as the preferred mode of governance in many states in recent years, including in environmental governance (Jordan 2008), and secondly, the ways in which it overlaps with another important aspect of governance - the multiple actors of governance. PPP can be defined as an arrangement existing between two or more organizations from two or more sectors working towards a commonly defined goal (Darlow and Newby 1997, Taket and White 2000). It involves the sharing of risks and benefits among partners, and depends on a great degree on interdependency, trust, co-operation, common goals, and the division of responsibilities and authority among partners (Kooiman 2003, Klijn and Teisman 2003, Davies 2002, Taket and White 2000, Darlow and Newby 1997).

Osborne (2000) defines partnerships as a long term strategic collaboration intended to realise the broader aims of partners. PPP may carry different labels such as joined-up governance, governance network, co-governance mechanism, strategic alliances, or deliberative forums (Sørensen and Torfing 2009). Kooiman (2003), however notes the difference between PPP and network: partnership involves interactions of two or more organizations from two or more sectors of society, while network interaction can occur between organizations, both inter-sector and intra-sector (Kooiman 2003). Based on the works of Sørensen and Torfing (2009) and Kooiman (2003), this thesis adopts a 'litmus test' to identify a PPP. Any governance arrangement that have the

following characteristics is labeled as a PPP; firstly, the actors are from two or more different sectors in the society, one which represents the government; secondly, the actors engaged in the governance mode are interdependent yet autonomous; and finally, the governance process is based on negotiated interactions and joint decision making.

Taket and White (2000) distinguish three different types of partnerships; strategic, tactical and operational. The strategic type of partnership is concerned with things like developing policy, development of political will and target setting which are more common at international and regional levels. The tactical type of partnerships on the other hand involves the establishment of bodies to carry out necessary work, development of instruments such as expertise, budgets and legislation, setting of operational targets and resource allocation. Finally, the operational type of partnerships encompasses the use of instruments, service delivery, and implementation which can be summarized as being primarily concerned with taking action and is more prominent at local levels. However, it is important to note that more than one type of partnership may be present in any particular situation.

There are three approaches which are commonly taken to the analysis of partnership; power, inter-dependency and performance (Morse and McNamara 2008). The third approach – studying the performance of partnerships is commonly adopted by scholars, for example Sørensen and Torfing (2009), Slater et al. (2007), and Hudson and Hardy (2002). In increasing the performance of PPPs, Slater et al. (2007) recommend that state actors should play a less controlling role and instead increase on co-ordinating and enabling roles, while Hudson and Hardy (2002) insist on the importance of existence of support and commitment from the most senior levels of all the participating organisations. Sørensen and Torfing (2009) in researching the effectiveness of partnerships have demonstrated how various metagovernance tools can be employed by actors of governance not only to assess the performance of PPP,

but also to enhance democracy. The following discussions are examples of how new governance is applied in the governance of environment, particularly waste governance.

## 3.3 Governance: The Application in Environmental, Waste and E-waste Management

The concept of governance which is characterized with its multiplicity in terms of levels, actors and modes has been widely applied in the analysis of environmental governance including issues of waste governance (or any special type of waste such as e-waste). As put by Davies (2009), 'environmental governance analyses are useful because they permit attention to the multitude of actors operating at a range of scales' (Davies 2009: 157). The remaining part of this section focuses on the application of multiple levels, multiple actors and multiple modes perspective in environmental governance analysis based on extensive literature review.

### 3.3.1 The Multiple Levels of Environmental Governance

The increasingly complex environmental issues warrant a holistic and comprehensive perspective of governance analysis which acknowledges the vertical and horizontal interrelations of the multiple actors, scales and modes governance, and could not longer depend on simple analysis which is based on discrete division of actors and scales. Examples from climate change and waste management issues have shown that the focus of the environmental governance has transcended beyond the commonly accepted geographical and political boundaries. For example, the issue of climate change governance shifts down from transnational focus to national and sub-national scales (Bulkeley and Betsill 2003), while the issue of waste management shifts upwards from local scale to supra-national scale (Bulkeley et al. 2005, Davies 2008, Levinson et. al 2008).

Betsill and Bulkeley (2006) have demonstrated that the application of multilevel perspective in the analysis of climate change governance recognizes the multiplicity of actors and modes of governance, beyond state actors and hierarchical mode, as normally accepted in traditional environmental governance analysis. The multilevel perspective highlights the reducing control of state actors at national level in decision making; which is not an indication of the weakening of the state but rather a 'redefinition of scope and scale of state activity' and a 'reorganization of social relations between actors', which in certain instances may possibly strengthen the state's power (Betsill and Bulkeley 2006: 153).

The multilevel perspective of environmental governance also allows for acknowledgement of sub-national actors in supra-national environmental concerns. This is demonstrated by Gustavsson et al. (2009) in a study on climate change mitigation action in Sweden. Gustavsson et al. (2009) finding resonates with the finding of Betsill and Bulkeley (2006) on this matter where local level interventions should be seen as part of global politics, alongside supra-national negotiations, agreements and policy development. The interlinking of 'power' and 'influence' of diverse actors at various levels is paramount in the construction of local governance of global environmental issue (Betsill and Bulkeley 2006: 154).

On the other hand, the issue of waste management received a wider and interrelated analysis with the application of multilevel governance perspective. Two examples are the work of Bulkeley et al. (2007 and 2005) and Davies (2008). The research by Bulkeley et al. (2007 and 2005) examine the nature and development of municipal waste policy in the north-east region of England, based on extensive data collection method such as policy documents analysis, semi structured interview, in-depth interview, participant observation and workshops; while Davies (2008) compares the processes, practices and

negotiations between different actors (operating at and across different scales), which led to policy interventions, in Ireland and New Zealand from data collected by comprehensive policy analysis and interviews. Studies by Bulkeley et al. (2005) and Davies (2008) have proved that the supra-national actors are exerting power that influenced and determined the policy at local level. For example, EU legislation such as statutory targets for diverting waste from landfill and waste management performance indicators are communicated to the local level, and thus has been very influential in shaping the policy at sub-national level in EU member countries (Bulkeley et al. 2005, Davies 2008). In the UK particularly, the European Landfill Directive has had a profound impact on the policy priorities and goals at all levels, and is changing the national, regional, and local policy framework for sustainable municipal waste policy (Bulkeley et al. 2005). The multilevel perspective of environmental governance adopted in two studies mentioned above has highlighted the transition of municipal waste governing system from 'a linear and state-dominated' system, to a perplexed and intricate interlinking relationship among 'various levels of state activity and non-state actors' (Davies 2008: 171, quoting Jessop 1994 and Rosenau 1992).

Far from being confined to the governance of municipal waste, the transition of governing system as mentioned above is also evident in governance of e-waste. The dispersion of governing authority from UN to nation states (at global level) and from EU to the European member states (at regional level) are reported in various literatures (see Levinson et al. 2008, Kocasoy and Durmus 2008, Khetriwal et al. 2008). Kocasoy and Durmus (2008) and Khetriwal et al. (2008), applied the multilevel perspective of environmental governance in analysing the dispersion of law on e-waste control from authority at regional level (EU) downwards to national level (EU member states), due to the enforcement of the WEEE directive and RoHS directive in 2003 (refer Section 2.4). The WEEE and RoHS directives require EU member states to formulate and implement national level laws on e-waste control by 13 August 2004, to

avoid legal action from the European Court of Justice (Mohan et al. 2008). The work of Kocasoy and Durmus (2008) and Khetriwal et al. (2008) have revealed that while the basic elements of e-waste problem in EU member states are similar, there are several ways of adopting EU directives in tackling it as different EU member states are interpreting the directives differently and the multiplicity in terms of actors and modes of governance varies between countries. Multilevel perspective of environmental governance analysis allows for appreciation of diversities among national level governing entities which results in differences in interpreting and shaping policies. Governance analysis from multilevel lens recognizes that no single solution is best for all member states due to this multiplicity.

Adoption of multilevel perspective of e-waste (for example by Goosey 2004) creates a space to look at other governance actors outside of the boundaries of traditional state entities. Multilevel perspective highlights PSAs as the targets of EU's WEEE and RoHS directives are other than state members. WEEE and RoHS require PSAs (manufacturers and retailers) to participate in managing e-waste by providing free take-back schemes for obsolete products; and redesign of products and substituting hazardous content in manufactured products to reduce the hazardous impacts of e-waste. As the manufacturing industries related to the production of electrical and electronic equipment are located across the globe, these directives thus have an indirect impact to other countries outside the EU, indicating an intricate linking of vertical chains of multiple levels of governance and horizontal lines of multiple actors of governance. For example, Dell (a computer manufacturer with the head office in USA) launched a world-wide scale of voluntary take-back scheme of all Dell branded computer and other brand computers in exchange of a new Dell brand computer; and a Japanese electrical and electronic equipment manufacturing company in Malaysia produced only RoHS's acceptable products (in terms of hazardous substances content allowable permit) as the products are exported to European countries.

Another example of the trickle down of supra-national power and authority to the national level governing entity is evident in the enforcement of Basel Convention (refer Section 2.4.2) in controlling transboundary movements of e-waste (see for example the works of Nnorom and Osibanjo 2008, Puckett 2005, Streicher-Porte et al. 2005, Widmer et al. 2005, and Puckett et al. 2002). The Basel Convention requires all member countries to formulate appropriate national legislation to prevent and punish illegal traffic of hazardous waste. The effect of Basel Convention on individual member countries is profound, and is evident through the growing amount of national level e-waste law (refer Table 3.1). It is apparent that many countries worldwide are starting to transfer the burden of e-waste management to manufactures and other parties. This development has significant consequences in e-waste governance. It introduces and creates an avenue for non-state actors, particularly the private sector actors from across the world to play a role in e-waste governance at national and supra national levels. Besides the PSAs, NGOs have also been actively involved in e-waste governance. For example, Basel Action Network (BAN) is an NGO based in the USA, which was purposely established to manage issues related to Basel Convention and movements of hazardous waste, even though USA is not a party to Basel Convention. The application of multilevel governance perspective in this case has highlighted the complex web of interactions between state and non-state actors of governance, which are operating at various layers of governance; indicating the significant of multidimensionality in environmental governance analysis. This is not achievable with the traditional analysis of governance.

Table 3.1: The e-waste legislations in different countries.

| **Country/ State** | **Law/regulation/legislation** | **Date of enforcement** | **Responsibility** |
|---|---|---|---|
| Switzerland | • Ordinance on the Return, Taking back and Disposal of Electrical and Electronic Equipment (ORDEE) | • July 1998 | • Manufacturer<br>• Importer |
| Taiwan | • Waste Disposal Act | • 1998 (amended) | • Producer (financial responsibility only, not physical responsibility) |
| Denmark | • Statutory Order from the Ministry of Environment and Energy No. 1067 | • December 1999 | • Local government |
| Netherlands | • Disposal of White and Brown Goods Decree | • January 1999 | • Manufacturer<br>• Importer |
| Norway | • Regulations regarding Scrapped Electrical and Electronic Products | • July 1999 | • Manufacturer<br>• Importer |
| Belgium | • Environmental Policy Agreements on the take-back obligation for waste from electrical and electronic equipment | • March 2001 | • Manufacturer<br>• Importer |
| Japan | • Specified Home Appliances Recycling Law<br>• Law for Promotion of Effective Utilization of Resources | • Enacted 1998, enforced April 2001<br>• 2001 for business PCs, 2003 | • Manufacturer<br>• Retailer<br>• Manufacturer |

| Country/ State | Law/regulation/legislation | Date of enforcement | Responsibility |
|---|---|---|---|
| | | for household PCs | |
| Sweden | • The Producer Responsibility for Electrical and Electronic Products Ordinance (SFS 2000:208) | • July 2001 | • Manufacturer<br>• Importer |
| Germany | • Act Governing the Sale, Return and Environmentally Sound Disposal of Electrical and Electronic Equipment (ElektroG Act) | • March 2005 | • Manufacturer<br>• Importer |
| Malaysia | • Environmental Quality (Scheduled Wastes) Regulations 2005 | • 15 August 2005 | • Manufacturer<br>• e-waste contractor |
| Korea | • EPR in Recycling Law | • 2003 | • Manufacturer |
| China | • Administrative Measures on the Control of Pollution Caused by Electronic Information Products (often referred to as the Chinese RoHS) | • Adopted 2006 and took effect 1 March 2007 | • Manufacturer |
| China | • Measures on Environmental Management of Electrical and Electronic Waste | • Adopted 2007 and took effect February 2008 | • Manufacturer<br>• Importer<br>• Retailer |
| China | • Management Rule on Recycling and Disposal of Waste Electrical Household Appliances | • Pending adoption | • Government agency<br>• Producer<br>• Importer |

| Country/ State | Law/regulation/legislation | Date of enforcement | Responsibility |
|---|---|---|---|
| | | | • Retailer<br>• Collector<br>• Enterprise<br>• Consumer. |

Sources: (Khetriwal et al. 2009, Yang 2008, Terazono et al. 2006)

As a conclusion, the application of multilevel perspective in environmental governance analysis highlights the significance of governance across the political boundaries of a sovereign state and the involvement of non-state actors in managing the global environmental issues which are becoming more complex. This perspective is more commonly applied in the Global North, compared to the Global South. However, as mentioned above, countries in the Global South are also involved in the intricate web of multiple levels and actors of governance and hence multilevel perspective may offer an avenue for a more comprehensive analysis of environmental governance.

### 3.3.2 The Multiple Actors in Environmental Governance

The involvement of non-state actors, which include the private sector actors (PSAs) and Civil Society Organisation (CSOs), in environmental governance multiplied rapidly after Rio Earth Summit 1992. There is evidence that private and civil society actors have become involved in processes of environmental governance in different countries in both the Global North (see Strømsnes et al. 2009 for case studies in Norway) and Global South (for example the work of Martens 2006 and Schwartz 2004 for involvement of non-state actors in China) in attempts to address environmental problems. The complex nature of ecosystem which is both dynamic and interconnected requires a move beyond the ‘command and control’ approach by the state actors. The multi-actor

perspective of environmental governance analysis provides an avenue for consideration of the roles of non-state actors in governance practice.

One of the main reasons of the involvement of non-state actors in environmental governance - either alone in practising self-governance, or together with state actors in co-governance, persuasion and hierarchical modes of governance - is the incapability of the state to manage and control environmental problems such as air pollution problem in China (Shi and Zhang 2006, Ma and Ortolano 2000), environmental conservation programmes in USA (Karkkainen 2004), and social problems including the issues of workers' and human rights (Auld et al. 2008). Non-state actors, especially the NGOs, step in to pressure the state actors and the private sector actors (PSAs). NGOs used wide range of tactics such as boycott campaigns, ecolabeling and environmental certification to pressure the PSAs to be more responsible of the impacts of their activities to the environment and the communities in which they operate, leading to the birth of Corporate Social Responsibility (CSR) (Auld et al. 2008). The roles of Civil Society Organisations (CSOs) in environmental governance, hence include raising environmental issues and maintaining civic and governmental interest in those issues, while 'pressing for governmental and PSA environmental reforms' (Sonnenfeld and Mol 2006: 125).

There are also instances where non-state actors are 'invited' by the state actors into environmental governance due to the lack of resources of the state such as expertise and financial, which is evident both in the Global North and Global South. One example is the involvement of non-state actors in controlling the water pollution issues and environmental conservation programmes in Chesapeake Bay and the Great Lakes USA Karkkainen (2004). A multi-actor governance framework was adopted as a solution due to crisis of state competence – where state capacity to solve the problem is being questioned – hence, the cooperation from non-state actors was sought. In this case, the

complex and dynamics nature of environmental problems proved to be too complicated to be governed through hierarchical method and by the state alone. As such the role of the state has transformed, from regulating to enabling.

Another example is regarding managing air pollution in China. In China, the government decided to offer for the involvement of non-state actors to control air pollution problems (Shi and Zhang 2006) which proliferates due to rapid increase of industrial activities in China since 1970s (Ma and Ortolano 2000). A proactive approach taken by the government of China by fostering bigger roles for non-state actors in environmental governance is probably a common sense for other countries (Shi and Zhang 2006) and particularly popular and effective in the West (Schwartz 2004), but is a radical move for China, where environmental protection is strongly monopolized by the state (Shi and Zhang 2006). However, as noted by Martens (2006), the inclusion of non-state actors in environmental governance in China, might just be a way to achieve other objective (rather than environmental considerations) such as to welcome international funding and assistance, as appeared in many 'show-case' nature protection projects (Martens 2006: 227). Besides that, another different aspect between these two examples (USA and China) is that the decision of China's government to adopt multiple-actor governance framework is also due to external pressure (apart from the incapability of the state to control air pollution problem), such as the pressure from donors (which in many cases are from the Global North) and the pressure to follow the trend which is happening worldwide (Shi and Zhang 2006).

The pressure from donors in shaping the decision and action of NGOs in less economically developed countries is also evident in Madagascar as found by Duffy (2006). Duffy (2006) explores the politics of environmental governance by examining the multiple-actor governance in Madagascar and found that the NGOs (which are often assumed and expected to operate in contestation with

the World Bank or the donor), have instead worked to achieve the neoliberal goals of the donor. This has transformed global environmental politics and formed new frontiers of environmental protection.

Analyses of multi actors governance in both the Global North and Global South, such as the work by Murdoch and Abram (1998) and Murdoch (1997) on governance in the UK, and Martens (2006) and Qing and Vermeer (1999) on governance in China have shown that although there are inclusion of non-actors participation in governance, their incorporation is usually on 'acutely constrained terms' (Murdoch and Abram 1998: 49). Involvement of non-state actors may include consultations and sharing of ideas with the state actors, and taking parts in government's regulation implementation programmes; where their involvement may lead to the effectiveness of government's programme (Martens 2006, Qing and Vermeer 1999, Murdoch and Abram 1998, and Murdoch 1997), but non-state actors are 'rarely invited into the central arenas of policy formulation' (Murdoch and Abram 1998: 49). The formulation of environmental conservation goals and policies remains the exclusive rights of state actors (Qing and Vermeer 1999).

Several analyses of environmental governance from the multi actors' perspective focus on the effectiveness of non-state actors' intervention. Among others are the case studies in China (Martens 2006, Schwartz 2004, Ho 2001) and Norway (Strømsnes 2009); in both cases, political background of one country is the most important factor in determining the successful intervention of non-state actors. According to Martens (2006) and Schwartz (2004), the inclusion of non-state actors in environmental governance in China has had limited impact due to the grip of the less democratic government. The Communist Party which is ruling China appears to be not supporting the growth of non-state actors (Martens 2006) by setting strict rules for the establishment of social organization (Ho 2001, Saich 2000). The dominance of state power in China is apparent in the conception and interpretation of NGO,

which is rather unconventional. There are three types of NGOs in China; the traditional environmental NGOs, environmental GONGOs (Government organized NGO) and semi-NGOs. Among the three types of NGOs, only the first mentioned is independent from the state; while GONGOs is separated from the government only in name and semi-NGOs are university-affiliated organizations (which cannot be deemed entirely independent as most universities in China are government owned except for private institutions). However, the ability of China's (traditional) NGOs to influence China's environmental policy development and enforcement is limited as many are suffering from limited skills, funding and autonomy and operating in a highly controlled political space (Schwartz 2004). GONGOs, due to their close relation to the government, have limited autonomy and are constrained in their ability to take positions which is critical of government environmental protection initiatives. There are two contradictory views on the establishment of GONGOs in China; one group viewed this as 'an intermediate step towards a more mature civil society' while the other group, seen it as an 'illegitimate frauds undermining the development of true social forces' (Martens 2006: 214). The most significant and influential NGOs are the semi-NGOs, as their work is normally of higher calibre than that produced by NGOs and is potentially more independent than that produced by GONGOs (Schwartz 2004).

Due to restrictions as mentioned above, the involvement of NGOs in environmental governance in China is not significant. This can only be changed if free political space is available, and NGOs are allowed to be more independent and empowered (Martens 2006, Schwartz 2004). In a similar vein, Shi and Zhang (2006) suggest that only if the government of China can do these three things can multi-actor governance happen in China; first, formulating a better legal framework to safeguard public participation in NGO's activities; second, allow freedom to access to information to the public; and third, the state must take the lead in practising the rule of law.

'Western societies' in the Global North are generally regarded as more open to the intervention of non-state actors (such as in effort to raise environmental awareness), or by being the mediator between the government and the society (such as in managing environmental issues) (Martens 2006: 226). However finding from the work of Strømsnes et al. (2009), has proven that it is not always the case. According to Strømsnes et al. (2009), an international environmental NGO – Greenpeace – has not been successful to establish itself in Norway due to the country's political culture. There are two 'culturally embedded anomalies' which have been identified by Strømsnes et al. (2009) in Norway; which are 'state-friendly society' and 'local community perspective' (Strømsnes et al. 2009: 391). In Norway, the culture of 'state-friendly society', allows the political system to invite non-state actors to participate in national politics, and to critique the policies of the government; but still be given funding from the government (Strømsnes et al. 2009). The government of Norway considers non-state actors as legitimate and support the activities of non-state actors (Strømsnes et al. 2009). In comparison to the case in China, where 'thin' democracy has hindered the development of non-state actors' involvement in environmental governance, the case in Norway is the opposite; the 'thick' democracy in Norway's political system has made it difficult for non-state actors to get a footing in the country (Strømsnes et al. 2009: 396).

From the examples in the literature discussed above, it is evident that the multi-actors perspective on environmental governance analysis has created a space for considerations of the roles of non-state actors in environmental governance. Besides that, as will be made clear later, multi actor governance analysis also enables for deliberation on the expanding and transforming roles of state actors. For example, Hysing (2009) assesses the roles of state actors in forest certification programme in Sweden (which is primarily a voluntary self-governance programme and autonomous from state), based on the 'governing without government' thesis, and found that the roles of state actors has shifted

from being the regulator to being an enabler; and such the modes of state actors governance has also transformed from focusing on hierarchy mode to persuasion mode. This finding implies two things; first, that state's role is not hollowed out in 'new' governance, instead it undergone transformation, and second, that non-state actors are being actively involved in governance through voluntary self-governance mode.

Multi-actors governance analysis has also been applied to the study on waste management such as in the work of Davies (2009) on solid waste management practice in New Zealand and Davoudi and Evans (2005) on regional waste planning in the UK. Both Davies (2009) and Davoudi and Evans (2005) find that the involvement of non-state actors is apparent in their case studies. Davies (2009) claims that state and internal non-state actors have been influential in shaping the landscape of waste management in New Zealand, and resulting in the shift of focus of waste management and policy from waste collection and disposal to waste minimization. According to Davies (2009), the lack of control from central government on waste management practices has led to the dominant role of the private sector actors particularly in matters regarding collection and disposal of waste.

On the other hand, the multiple actor governance framework, which was used by Davoudi and Evans (2005) to investigate the implication of collective action involving state and non-state actors (in a multi actor steering committee called Regional Technical Advisory Bodies or RTAB) in regional waste management planning in England has shown that the involvement of non-state actors is not contributing to the effective of the planning process, compared to the traditional systems of government. This is due to 'cultural assumptions' which doubts its legitimacy and accountability (Davoudi and Evans 2005: 514).

The multiple actors' analysis in waste governance in the Global South is more complicated. This is because of the presence of an additional of waste

governance actors; which is the informal waste recyclers (which includes scavengers and middlemen). Scavengers and middleman play an important role in waste management in most Asian countries because of the significant impacts of their activities to the economy and waste management (Ray 2008). The practice of recycling has become so 'market driven' and 'selective' in the Global South due to the attachment of economic value to waste (Visvanathan and Norbu 2006: 11). Regarding this matter, the fact that there can be as much as four grams of gold from one personal computer (Streicher-Porte et al. 2005), has resulted in burgeoning of e-waste recycling activities in many Asian countries (Ray 2008), where many were conducted without the consideration of its impacts on health and environment. This led to the involvement of international NGOs in e-waste governance such as the Basel Action Network (BAN) and Silicon Valley Toxics Coalition (SVTC) which are based in the USA, to lobby the state actors for formulation of law to ensure the safe recycling of e-waste and to pressure the PSA to restrict the use of hazardous substances in electrical and electronic equipment, and to be responsible in the end-of-life of their products.

An analysis of e-waste governance based on multiple actors' perspective was carried out by Deathe et al. (2008). Deathe et al. (2008) analysed and evaluated policy goals and financing mechanism incorporated in partnership programmes in the provinces of Alberta, Saskatchewan, British Columbia, Nova Scotia and Ontario in Canada; and found that partnerships and the sharing of responsibility between states and non-state actors had been successful in diverting e-waste from landfill through the recycling process. However, Deathe et al. (2008) argue that the effort was insufficient and they suggest that tougher 'up-stream' control (or control at the manufacturing phase) is introduced by means of redesign or 'Design for the Environment' (DFE). This shifts the responsibility to tackle issues related to e-waste onto the shoulder of the non-state actors, particularly the private sector actors.

Based on the selected cases from the literature which are discussed above, a conclusion can be made that multiple actors perspective of environmental governance allows for consideration of non-state actors, whilst recognizes the transformation or expansion of state actors in governance process. In several instances, non-state actors are invited to be a part of the governance process, often with a limited independence especially in countries where issues of democracy and political liberty is at stake. Governance analysis through the multiple actors lens is appropriate in the case of e-waste management issues due to the nature of e-waste which is hazardous and valuable. Participation from the PSAs is significant in e-waste governance due to the pressure from the state actors and NGOs.

### 3.3.3 The Multiple Modes in Environmental Governance

Governance analysis from the perspective of multiple modes (modes is defined in this thesis as a way governance action is carried out) through hierarchical, persuasion, self-governance and co-governance modes (or any combinations of these) has been applied in many areas of environmental governance studies. There are several examples on the application of multiple modes governance analysis such as the work of Grossman (1999) on the effectiveness of hierarchical mode in clean air regulation in the USA; Sandler (2004) on hierarchical intervention in ensuring the reduction of Chlorofluorocarbons (CFCs) (a type of gas used as refrigerants which induced ozone depletion) in more economically developed countries to meet the obligations under Kyoto Treaty; Smith (2007) on persuasion mode of governance by PSAs (mostly the airline companies and insurance companies) in persuading passengers to offset their carbon emissions by paying to have trees planted at selected locations around the world in programmes such as Climate Care (http://www.jpmorganclimatecare.com/) and The CarbonNeutral Company (http://www.carbonneutral.com/); Hall and Taplin (2006) on the effectiveness

of NGO campaigns in influencing climate policy in Australia; Dinica and Bressers (2004) on the application of co-governance mode analysis in implementing environmental policies; and Murdoch and Abram (1998) on the limits of non-state actors (particularly the CBOs) participation in related to town and housing planning.

In many instances, several modes of governance co-exist at one particular time in managing many environmental issues. As such, there are also literatures which focus on the combination of governance modes such as the work by Delmas and Keller (2005) who focused on the combination of persuasion and self-governance modes in 'Waste Wise' programme in the USA which involves the USA Environmental Protection Agency and PSAs; and by Bell and Hindmoor (2009) focusing on the combination of hierarchical and self-governance modes in increasing energy efficiency among private firms in the Netherlands.

There are also studies, where perspective of multiple modes of governance, is viewed together with the perspective of multiple actors and levels of governance. Two examples of such case studies in waste governance are the work of Davies (2008) and Bulkeley et al. (2007). Davies (2008) recognizes the co-existence of several modes of municipal waste governance in waste management planning and practice in various governance scales in New Zealand and Ireland, which involves the intervention of state and non-state actors. On the other hand, Bulkeley et al. (2007) considers the perspectives of multiple modes, levels and actors of governance, and develop an analytical approach (called the modes of governing approach) to address the issues of structures and processes of governance. Bulkeley et al. (2007) interpreted mode of governing as 'a set of governmental technologies deployed through particular institutional relations through which agents seek to act on the world/other people in order to attain distinctive objective in line with particular kinds of governmental rationality' (Bulkeley et al. 2007: 2739). The use of this

analytical framework has revealed that the multiple modes of governance are sometimes 'intermeshed' and 'in conflict' with one another (Bulkeley et al. 2007: 2749). One finding of the work of Bulkeley et al. (2007) is in agreement with the finding from Davies' (2008) work; that the environmental governance analysis and the multiplicity perspective is not a signal of reducing power of the state actors in governing process, but rather is a way to strengthen the state actors, by sharing of power with and transferring the responsibility to other actors. In the following sections, the perspective of multiplicity in governance mode as applied in analysis of environmental, waste and e-waste in the literature are discussed.

### *The Application of Hierarchical Mode in Environmental Governance Analysis*

One example of the application of hierarchical mode perspective on environmental governance analysis is in the work by Agamuthu et al. (2008) on national level solid waste management in Malaysia. Agamuthu et al. (2008) analyse the process of the centralization of solid waste management authority by the federal government of Malaysia with the introduction of The Solid Waste and Public Cleansing Management Act 2007. The law, which was gazetted on 30 August 2007, transfers the power of waste management from local governments (third level government) to the federal government (first level government) in the attempt to increase efficiency and providing high quality services in solid waste management in the country. Under this law, solid waste management services are provided by a company -'Malaysian Solid Waste Management Corporation'- which is owned by the federal government. The flow of hierarchical authority (from lower tier of government to upper tier of government) is in contradiction of the flow in Europe where EU directives shapes the waste policy of member countries (from upper tier to lower tier of government) (see Davies (2008) for case study in Ireland and Bulkeley et al. (2005) for case study in the UK). This action is seen as a way

for federal government to coerce its power on state government (second level government, which controls local government) especially in five states (out of fourteen) which are not ruled by the *Barisan Nasional* (the ruling party). From the persuasion mode of governance perspective, Agamuthu et al. (2008) found that the law lacks incentives for waste separation compared to other Asian countries such as Japan and Singapore, which may have an impact on its effectiveness. As shown in the work of Agamuthu et al. (2008) above, governance analysis from the perspective of hierarchical mode of governance overlaps with persuasion mode and intertwined with the multiple actor and multiple level of governance modes; indicating that the complex nature and structure of waste management require more than just one perspective of governance to be understood comprehensively and holistically.

The perspective of hierarchical mode of governance is also applied in e-waste governance analysis, and is apparent in studies on enforcement of laws at various levels such as Basel Convention at global level (see Levinson et al. 2008 and Mohan et al. 2008), WEEE and RoHS directives at regional level (see Khetriwal et al. 2008) and various national level laws across the world (see for example Yang (2008) on case study in China). As supra-national laws (such as Basel Convention, WEEE directive and RoHS directive) have significant influence on national laws on e-waste control in many countries, the hierarchical perspective analysis overlaps with the perspective of multiple levels governance. Zhang (2009) and Yang (2008) applied the hierarchical perspective in analyzing e-waste governance in China. The government of China began taking hierarchical action to control e-waste since 1990, upon the submission of the country as a party to Basel Convention (Zhang 2009). Among the law formulated is on the ban of import of twenty one types of e-waste in 2000; the law was condemned by the Greenpeace as ‘not working’ as the e-waste is kept being smuggled into China. Due to the pressure from international NGOs such as Basel Action Network (BAN), China tried to improve its hierarchical control of e-waste by formulating another law that

prohibits illegal recycling process in 2002, which has also shown limited success thus far. The ineffectiveness of hierarchical control of e-waste in China is possibly due to lack of enforcement as suggest by Streicher-Porte (2005) and Widmer et al. (2005).

However, the application of hierarchical mode in e-waste governance in Switzerland is relatively more successful compared to the experience in China. Switzerland introduced 'The Ordinance on the Return, Taking back and Disposal of Electrical and Electronic Equipment' (ORDEE) in 1998 which is based on the EPR (Extended Producer Responsibility) principle. ORDEE is employed by delegation of responsibility (in terms of function and financial matters) among e-waste stakeholders which includes state and non-state actors (see Table 3.2 on the roles and responsibilities of all stakeholders involved). Some responsibilities are mandated by ORDEE, while some others are stipulated by PRO ('Producer Responsibility Organizations' – an organization which organised voluntary collection and management of e-waste before the introduction of ORDEE). According to Khetriwal et al. (2009), this mechanism is very effective in Switzerland as the amount of e-waste that goes as municipal solid waste has been significantly reduced.

Table 3.2: Actors and responsibilities in the Swiss e-waste management system

| **Actors** | **Roles and responsibilities mandated by ORDEE** | **Roles and responsibilities mandated by PROs** |
|---|---|---|
| Government | • Framing the basic guidelines and legislation.<br>• Licensing authority for recyclers | |
| Manufacturers/Importers<br>PROs | • Economic and physical responsibilities | • Managing day-to-day operations of the system, including setting the recycling fees, as well as |

| Actors | Roles and responsibilities mandated by ORDEE | Roles and responsibilities mandated by PROs |
|---|---|---|
| | | licensing and auditing recyclers |
| Distributors and retailers | • Take-back of any product that they have on sale, irrespective of whether the product was sold by them or not. | • Responsible for making clear of the amount of Advance Recycling Fee (ARF) in the customer invoice. |
| Consumers | • Obligated to return discarded appliances to retailers or collection points | • Bear financial responsibility through the recycling fee on new product purchases. |
| Collection points | | • Collect all kinds of e-waste free of charge and ensure the safety of the disposal products to prevent pilferage or illegal exports. |
| Recyclers | • Adhere to minimum standards on emissions.<br>• Take adequate safety measures concerning employee health.<br>• Authorisation required to operate a recycling facility from cantonal government | • License from the PROs required. |

Source: (Khetriwal et al. 2009)

Analysis based on the perspective of hierarchical mode of governance as discussed in the case studies in China and Switzerland, has shown that hierarchical action can be an effective mode of e-waste governance if it is complemented with efficient enforcement action. It indicates two important things; first, that a strong political will from the state actors is paramount in ensuring that strict enforcement action is in place; and second, it may require

the involvement of more than just the state actors, and should include an involvement from the private sectors and civil society actors. Taking the findings of Agamuthu et al. (2008) on solid waste management in Malaysia into consideration, there is a possibility that blending hierarchical mode with persuasion mode of governance could further increase the efficiency of hierarchical action in waste management. As evident from the case studies brought forth, governance analysis from hierarchical mode perspective is intricately linked with the persuasion mode and the multiple actors perspectives.

***The Application of Persuasion Mode in Waste Governance***

In a comparative analysis of waste governance in New Zealand and Ireland, Davies (2008) has adopted the multiple levels and multiple actors perspectives, and has described one example of persuasion mode of governance in her discussion on the expanded roles of state actors. Davies (2008) brought forth an example of national level campaign organized by the national government of New Zealand (with coordinated effort from the state actors at local and regional levels) on waste awareness called 'Reduce Your Rubbish' campaign. The campaign which was launched in 2003 was aimed to improve attitudes and behaviour of households towards waste and encourage them to take simple actions to reduce waste. An almost similar public education campaign was organized by the Irish government in late 1990s, which targets to persuade people to reduce the use of plastic bags (Bell et al. 2010). These two cases are chosen to be compared here due to its similarities; firstly, both campaigns are initiated by the government, and secondly, both campaigns target public at large to change behaviour to reduce production of waste (or specifically plastic bags in Ireland). However, they produce different results. While the campaign in New Zealand was successful, the campaign in Ireland failed. However, a dramatic result on the reduction of plastic bag usage was shown after the government of Ireland decided to impose a tax, (levied at the point of sale)

upon the purchase of plastic bag. This policy resulted in 90% reduction in the production of plastic bags in Ireland. This indicates that in this case, a hierarchical mode can sometimes be more effective than a persuasion mode in waste governance. On the other hand, the success of the campaign in New Zealand may be due to the effective and efficient publicity involving various techniques such as broadcast on national television using well known celebrities and comedy competitions; developing a website; and a hotline for households seeking advice from local councils. Half of the funds (around NZ$ 400, 000 or £200, 000) was spent on media events and publicity. Based on this example, Davies (2008) suggests that a campaign must be on-going (not a one-off event) to ensure a long term impact. However, a long term, wide coverage of public education campaign would require a huge financial cost from the government. An intervention from PSAs might be able to reduce the financial burden from the government especially if this kind of public education campaign is to be replicated in a less economically developed countries where state's economic resources is restricted.

Other than the state actor, CSOs - especially NGOs – do play prominent roles in the persuasion mode of governance, such as the governance of e-waste. In late 1990s, many NGOs voiced their concern with the unsustainable nature of the management of e-waste by the electronic and electrical industry and started to fight for environmental justice, environmental health and exploitation of vulnerable population, due to the nature of e-waste which contains a substantial amount of hazardous substances and precious metals. As e-waste is a global issue, the voice of international NGOs is louder compared to small, local-based NGOs. Among the international NGOs which are actively involved in e-waste issue are Basel Action Network (BAN), Silicon Valley Toxics Coalition (SVTC), Centre for Environmental Health (CEH), Clean Production Action (CPA), European Environment Bureau (EEB) and Greenpeace. In 2001, BAN, SVTC, CEH and CPA founded the 'Electronic Take Back

Campaign' (ETBC) (formerly known as Computer Take-Back Campaign – CTBC).

Wood and Schneider (2006) and Spar and La Mure (2003) analyse environmental governance from the perspective of persuasion mode of governance, focusing on the roles of NGOs in USA. They found that NGOs aimed to reach three target groups in their campaigns; state actors, PSAs and society. In the beginning of their involvement in e-waste governance, NGOs targeted state actors and pressure for formulation of law, especially on safe recycling of e-waste and restrictions on the use of hazardous substances in electrical and electronic equipment. However, since the late 1990s, NGOs changed their tactics and started to focus on PSAs (Trumpy 2008, Seidman 2007), and found that getting PSAs to change their policies can often be easier than urging the state actors to formulate policies (Vogel 2005). According to Wood and Schneider (2006), this tactic acts like a double-edged sword as the changes in PSAs' policies serves as a stepping stone to change state legislative as states compete to attract investors through the creation of business friendly environment (Levy and Prakash 2003).

A 'naming and shaming' strategy has also been used by the NGOs in the USA in the 1990s to pressure the PSA to becoming a 'greener producer', and has often been effective (Vogel 2005). For example, CTBC's 'Computer Report Card', and Greenpeace's 'Guide to Greener Electronics' campaign that ranks manufacturers based on selected criteria into leaders and laggards has put pressure on PSAs to compete to become more environmentally friendly. NGOs also published reports of research; two reports which have significant impact by BAN and SVTC are 'Exporting Harm: The High Tech Trashing of Asia' (2002) and 'The Digital Dump: Exporting Re-use and Abuse to Africa' (2005). These reports have help educating the public about e-waste, pressured the PSAs to improve environmental policies and attracted the media attention to the issue.

Other than state actors and CBOs, PSA is also keen in adopting persuasion in governance. For example, on 9th November 2008, a television station in the USA (CBS) has aired the intricately complex issues (interwoven of environmental, economic, social and politics) of e-waste recycling in a programme called '60 Minutes' (available at http://www.cbsnews.com/video/watch/?id=4586903n) in a place called Guiyu in China, resulting in the government of China reviewing the country's e-waste policies.

The application of persuasion modes of governance in waste and e-waste governance as shown in case studies above reflects four things; first, the roles of state actors in governance is no longer restricted to hierarchical mode, but is extended to include the persuasion mode; second, it allows some space for the consideration of non-state actors in governing process; third, while the target group of the persuasion mode by state actors is the general public, NGOs expand their target to include the state actors and PSAs; and fourth, the efficiency and success rate of persuasion mode of governance employed by the state actors might increase if it is combined with other modes such as hierarchical, be on-going with loud publicity.

The application of persuasion mode of governance is more challenging in the less economically developed countries, relative to more economically developed countries due to two main reasons; persuasion mode by state actors may be hampered due to lack of financial resources to carry out wide spread, and long term campaign, while persuasion mode by non-state actors might be hampered by lack of 'political liberalisation' (Martens 2006: 226) by the state actors to support the independent actions of non-state actors.

### *The Application of Self-Governance Mode in Waste Governance*

Self-governance mode of waste governance is commonly adopted by civil society in many less economically developed countries, with examples from India, Bangladesh, Ghana, Burkina Faso (World Bank 2005), Indonesia (Pasang et al. 2007) and Pakistan (Ali and Snel 1999). In these countries, self-governance mode arises in response to local conditions where municipal authorities are unable to cope with the rapidly expanding demands for a modern and formal waste management system due to lack of financial capacities, insufficient equipment, staffs and expertise (Ali and Snel 1999). Two examples of how the self-governance mode is adopted in waste management in the Global South are from the work of Ali and Snel (1999) in Karachi, Pakistan and Pasang et al. (2007) in Jakarta, Indonesia. The self-governance mode adopted in both case studies, involves three groups of non-state actors which are; waste generators (which are the householders), waste collectors, and civil society organizations.

The self-governance process in cases in Indonesia and Pakistan involve collection of fees from the residents to pay for the appointed contractors and workers, and to buy related equipment, while community organizations members work on voluntary basis. In Karachi, Pakistan, a group of housewives set up a society called 'The Karachi Administration Women's Welfare Society (KAWWS) in 1990 to manage household waste in the area. Each member of KAWWS pays a monthly fee of ₤0.90 to purchase waste collection bins, and to pay for the service of street sweeping workers and refuse vehicle drivers (Ali and Snel 1999). In Jakarta, Indonesia, neighbourhood associations collect a fee of ₤2.00 per month from every resident to pay the workers who collect wastes from households.

On the other hand, governance analysis based on self-governance mode in waste management in more economically developed countries is not triggered

by the incapability of state-actors to provide services. For example, in the case of e-waste management, self-governance by private sector actors was initiated by the pressure to be more responsible in the disposal of their products after it reached its end-of-life. The pressure is either exerts by state actors (to comply with certain regulations and law) or NGOs (to collect e-waste via take-back schemes); signalling a direct impact and interrelations of the two previously mentioned modes. For example, the enforcement of WEEE and RoHS in the EU in 2003 has resulted in increasing amount of self-governance action by non-state actors' who work in a network. A group of non-state actors based in Brussels, Belgium set up 'Global e-Sustainability Initiative' (GeSI). Among its members British Telecom (BT), Telecom Italia, China Telecom, Motorola, Nokia and WWF. Its main aim is to achieve sustainable development objectives through innovative technology (www.gesi.org). Similarly in Europe, several PSAs such as Hewlett Packard, Sony, Braun and Electrolux, set up the European Recycling Platform to enable the producers to comply with the WEEE directive. The main target of the organization is to evaluate, plan and operate a pan-European platform for recycling and waste management services (Widmer et al 2005).

Self-governance of e-waste in the USA, on the other hand, is due to the strong persuasion actions (especially the 'naming and shaming') by the NGOs (Wood and Schneider 2006) which has forced PSAs to take actions. This is due to the lack of federal level law on e-waste control in the USA. As a result Dell (USA) launched its voluntary take-back scheme of all Dell branded computer and other brand computers in exchange of a new Dell brand computer (worldwide); and followed shortly after by Apple (which is limited to USA only). Dell's action is an example of how multiple modes (and actors) of governance co-exist in an issue; persuasion mode (by the NGOs) has led to self-governance action (by a PSA) which is applicable at various level of authority beyond the boundary of a sovereign state.

### *The Application of Co-governance Mode in Waste Governance*

One of the most commonly adopted types of co-governance mode in waste management is Public-private Partnership (PPP). PPP has been adapted as one of the modes in waste governance both in the Global South (see for example Ahmed and Ali 2006 and 2004, and Forsyth 2006 and 2005) and in the Global North (Slater et al. 2007, Binica and Bressers 2004). In both contexts, PPP is introduced to achieve two main objectives; firstly to provide services (or to improve available services) or solve issues related to waste management (seen as a way to strengthen local government), and secondly, to include (or increase) public participation in the implementation phase which is seen as a way to increase democracy. However, in the Global South, the inclination towards the first objective is stronger than the second. This is apparent from the works of Ahmed and Ali (2006 and 2004) on PPP in solid waste management in Bangladesh, where they compared data collected by a mix of methods (in-depth interviews, semi-structured questionnaires and observation) in four major towns (Khulna, Patuakhali, Sylhet and Dhaka) and Forsyth (2006 and 2005) who works on the evaluation of democracy, legitimacy and accountability aspects of PPP in India and the Philippines, which will be discussed in detail in the following paragraph.

According to Ahmed and Ali (2006), there are three factors which determined the effectiveness of a PPP; the design of PPP, the availability of political will and the establishment of facilitating agencies. It is crucial to understand the design of a PPP (which includes the structure, mechanism and actors involved) due to the nature of PPPs which are both dynamic and unique. The correctly designed PPP should have well balanced incentives to all partners to avoid resistance to cooperation among partners. This finding is not only true for the PPPs in the Global South; it is also in agreement with findings of Slater et al. (2007) based on their work on PPPs in England. Slater et al. (2007) suggest consistent assessment of lifecycle of PPP to understand the motivations,

characteristics and activities of PPP to maintain its efficiency. The second factor which can have an effect to the effectiveness of a PPP (other than the design of PPP mentioned above), is the available support it receives from all actors (the public sector, private sector and the citizens) and a strong political will from influential politicians. The third factor, as noted by Ahmed and Ali is the establishment of facilitating agencies (independent agencies set up to bridge the gap between partners), to improve effectiveness of PPP. Their studies have shown that facilitating agencies have been successful in increasing accountability and service.

Although PPP is more commonly applied and has shown relative success in the Global North than the Global South, exact duplication may not be the best option. In Bangladesh, Ali and Ahmed (2006) noted that partnerships between public sector and large conglomerate (as commonly happen in the Global North) do not produce success; instead PPPs between public sector actors and a string of small solid waste management companies, informal waste sectors and society (in a vertical integration - where all actors may benefit) have shown a better level of success. Similarly, Forsyth (2006, 2005) in his study on waste-to-energy projects in India (Lucknow, Chennai) and Philippines (Ayala Alabang, Baguio) revealed the same outcome. Among the reasons cited by these scholars for the difference in the results of PPP in different areas are political background (including decision making autonomy), relative wealth and economic complexity (Ahmed and Ali 2004, Forsyth 2006).

Forsyth (2006, 2005) studied waste-to-energy projects in India and Philippines from the perspective of deliberative environmental governance. Based on detailed documentary newspaper research for background information and in-depth interviews (with key actors from local government, CSO and PSA), Forsyth concluded that PPP is not a cure in democratic deficit in decision making. Instead, he found many evidence of lack of democracy, legitimacy and accountability in PPP in both countries which is due to; the political

environment in the two countries where open access to political debates by actors are not always possible. This is a clear indication of lack of democracy where people's right to voice their opinion is restricted. Secondly, Forsyth found that the PPP's participants are chosen (not elected) by the most powerful partner; sometimes not based on ability but based on who can provide a stronger support to the most powerful partner. This, besides an indication of lack of democracy, also implies lack of legitimacy and accountability in decision making. In cases of PPPs, both in India and the Philippines, Forsyth found that the local poor are always left out.

A co-governance perspective is applied in the analysis of e-waste governance in more economically developed countries particularly the application of PPP in take-back recycling schemes in the USA (Wagner 2009, Renckens 2008), Canada (Deathe et al. 2008), and Switzerland (Khetriwal et al. 2009). One similar finding from these analyses is that PPP is an effectiveness mode of managing e-waste. Wagner (2009) reported that PPP has increased the amount of e-waste collected and recycled in the state of Maine, USA and thus diverted from disposal and halting export, while Deathe et al. (2008), discovered the same finding in the provinces of Alberta, Saskatchewan, British Columbia, Nova Scotia and Ontario in Canada. Reckens (2008), on the other hand, extends the geographical scope of his research to focus on the PPP mode at federal level, and explores the potential of PPP in the form of multi-stake holders' dialogue in governing e-waste. He discovered that PPP as applied in four multi-stakeholders dialogues - Common Sense Initiative (CSI), the National Electronics Product Stewardship Initiative (NEPSI), Responsible Recyclers Practicers (R2 practices) and Electronic Product Environmental Assessment Tool (EPEAT) - is a practical approach to governing e-waste due to its ability to move a conflict stance to a constructive dialogue, and to increase the legitimacy of the initiative by the participation of multiple stakeholders. Comparisons made from these two findings signify that the

effectiveness of PPP is not limited to the operating phase but also at the planning phase of e-waste management process.

Apart from being applied to manage e-waste in different countries, PPP is also applied at global level. The UN recognizes the importance of co-governance as a tool to uphold UN principles and to achieve the aims of sustainable development. PPP was chosen as the most appropriate tool to manage global e-waste issue as specified in the Nairobi Declaration of 2006 (following Johannesburg Summit on Sustainable Development in 2002). There are three partnership programmes in place regarding e-waste management at a global level, undertaken by Basel Convention Secretariat; they are the Mobile Phones Partnership Initiative (MPPI) started in 2002; Partnership for Action on Computing Equipment (PACE) in 2008; and StEP (Solving the E-waste Problem) in 2004. The role of UN as the initiator and coordinator of global level PPP is very significant due to the nature of e-waste problem. Firstly, e-waste governance involves international PSAs as manufacturers of electrical and electronic equipment which are produced and traded worldwide; and secondly, e-waste is still rampantly traded across the globe despite the provision on restrictions on transboundary movement of e-waste in the Basel Convention. From the case studies on waste governance analysis from the perspective of PPP as a mode of co-governance as mentioned above, it is evident that PPP is a suitable mode of governance in managing waste either to achieving targets of improving service or increasing public participation, or perhaps both in certain instance.

From the discussion above, a conclusion can be made that governance analysis from the perspective of multiple modes provides insights on the different mechanisms of which governance actions are carried. Apart from that multiple modes analysis also provides deeper understanding on the roles of different actors (as actors behaves differently in different modes) hence allowing for a more complete understanding of governance process.

## 3.4 Conclusion

The shift from government to governance has strong influence in shaping the studies on environmental issues; ranging from climate change issues to waste management in various countries. The characteristic of new governance, in terms of the multiple levels, actors and modes involved, are used to understand environmental problems from different perspective. Evidence from available literatures demonstrated that the concept of new governance has the potential to provide a wide and comprehensive perspective of the issue, for example in the study of e-waste governance.

As shown in the literature reviewed in this chapter, it is evident that the perspective of multiple levels, actors and modes of governance in governance analysis has provided a comprehensive and holistic understanding of environmental governance. A multilevel perspective on governance analysis highlights the 'blurry' political boundaries involved in managing environmental issues, especially many environmental problems are trans-political boundary. The processes involved in the governance of e-waste, for example are made more explicit by adopting the multi-level perspective as many issues regarding it transcend political boundaries such as the trading of e-waste. The issue surrounding e-waste which is global in nature benefits from the application of this perspective. Therefore, the study of local level e-waste law, for example, is not complete without considering the regional and global legal context within which they are established. On the other hand, the application of a multi-actor perspective in analyzing environmental governance provides an avenue for consideration of non-state actors as an important governance actor other than the traditional state actors, and a way of reconsidering the role of the state in governance. Finally, the application of multiple modes of governance facilitates an understanding of the multiple mechanisms taken to achieve governance and the roles of governance actors in

these processes. Therefore, a conclusion can be made that application of multiple levels, actors and modes of governance is most suitable to understand the issue of e-waste governance based on the analysis of the literature.

# Chapter 4: Methods of Researching the Roles of Actors in E-waste Governance

## 4.1 Introduction

This chapter explains and examines the methodological routes which were undertaken in this research. It is divided into three sections; the first part highlights the research design, the second part delineates the research methods, and finally, the third part reflects my experiences in conducting this research. The research began with a wide-ranging desk study to identify the critical elements of the research process such as the research problem, objectives, and theoretical and conceptual frameworks, which then led to the formulation of the research questions that have guided the work. According to George and Bennett (2005), these initial tasks are of utmost importance in the research process as they guide the decisions that follow.

The research design forms the backbone of the research (George and Bennett 2005). It encompasses the tasks of identifying an appropriate research methodology, approach, methods and analytical technique. Besides the fundamental concept, the decisions taken in arriving at the research design were also driven by the research aims and research questions. As is explained and justified later in this chapter, a qualitative methodology using a case study approach was chosen as the most appropriate mode of inquiry. Data for the research were obtained by adopting multiple methods of data collection namely interviews, observations and review of documents, and were later analysed by applying the thematic analysis technique. Kitchin and Tate (2000) in stressing the critical importance of research design have used the process of constructing a building as an analogy; they equate research design to a construction plan. Failure to provide an adequate construction plan before commencing the construction process might end up in deeper problems at a later stage; likewise failure to prepare a detailed research design prior to

commencing research might cause problems in later stages of the research process. Section 4.2 presents a more detailed explanation of the research design process and justifications of why such decisions were deemed fit and thus chosen for this research.

The next step in the research process is the execution of the research plan as specified in the research design. This is a complex and challenging process. Section 4.3, discusses in detail the research methods, including sampling of respondents, the collection of data and its analysis. Also discussed in this section are the limitations and hurdles that were encountered during the research and how they were mitigated. This is then followed by a narration of my research experiences in Section 4.4, before concluding in Section 4.5.

## 4.2 Research Design

Research design is a process of making decisions on critical elements of the research, such as the formulation of research objectives and structure (George and Bennett 2005) and the determination of appropriate data collection methods and data analysis techniques (Philliber et al. 1980). Yin (2003: 20) defines research design as a 'logical sequence that connects the empirical data to a study's initial research questions and, ultimately, to its conclusions'. Several authors, for example Philliber et al. (1980), view research design, especially in qualitative research, as the research 'blueprint'. However, this idea is opposed by Mason (2002), who claims that the characteristics of qualitative research which are exploratory, fluid, flexible, data-driven and context-sensitive make it impossible for a researcher to write an entire advance blueprint prior to conducting research. However, in my view, and based on my experience, a detailed research design is paramount, and is the most crucial step in the research process. It helps a researcher to focus on the study, and holds all the parts and phases of a research project together. Yin (2003: 21) finds that a carefully thought through research design is an excellent way to

avoid a situation where the 'evidence does not address the initial research questions'.

The five elements that were considered in arriving at my research design were: the research methodology, research approach, data collection methods (including ethical consideration and validity of data), research scope and data analysis techniques (see Figure 4.1). Each of these elements is discussed in detail in the following sub-sections.


Figure 4.1: The elements of a research design

### 4.2.1 Research Methodology: The Qualitative Methodology

My main aim in conducting this research was to explore and explain the roles and involvement of multiple actors in e-waste governance. To achieve this, respondents needed to be allowed to express their perspectives freely. A qualitative approach provides an open environment conducive to the exploration of themes without prior assumptions, something that is hard to achieve taking a quantitative approach. Qualitative methods also have the

ability to produce a wealth of detailed information, necessary if e-waste governance is to be investigated in an exploratory manner. Unlike quantitative research methodology which does not recognize individuality of research subjects or respondents (and therefore may oversimplify the complexities of interaction of actors of governance in the case of this research); qualitative methodology recognizes subjective ideas, experience and perspective of individual respondents thus inducing the production of richer insights and more precise generalisations. Producing or generating rich data is made possible by adopting a qualitative approach because it accepts a wide variety of data sources such as people, objects and documents, and it offers diversity in data generating methods. The in-depth nature of qualitative study promotes the generation of richer data even though the number of respondents is normally smaller compared to a quantitative study. Therefore, due to the reasons stated above, qualitative methodology was chosen over quantitative methodology in conducting this research.

### 4.2.2 Research Approach: The Case Study Approach

Once the decision on research methodology has been made, the next important decision is to arrive at an appropriate research approach. Creswell (2007) suggests five types of qualitative research approach: narrative research, phenomenology, grounded theory, ethnography and case study. One way to decide on the right approach is to assess the type of research questions posed. Yin (2003) suggests that the case study approach is the most appropriate approach when undertaking research which asks mostly ‘how’ or ‘why’ questions. As my research aims to explore the complexities of governance actors’ interactions, and does ask mostly ‘how’ and ‘why’ questions in order to understand the significance and implication of the diverse roles of multiple governance actors, case study approach is the most suitable approach. Furthermore, case study approach which is defined by Creswell (2007: 73) as an approach where ‘the investigator explores a bounded system (a case) or

multiple bounded system (cases) over time, through detailed, in-depth data collection involving multiple sources of information (e.g., observations, interviews, audiovisual material, and documents and reports), and reports a case description and case-based themes', has the potential to generate data with high level of explanatory richness (Denscombe 2005, Yin 2003, George and McKeown 1985). Data richness offers by the case study approach is crucially significant in the study on e-waste governance in dealing with nuances and intricacies of governing process; thus inducing the production of a precise and comprehensive result.

### 4.2.3 Research Scope

One increasingly important environmental issue across the world today is waste management. Waste management is becoming more challenging than before with the emergence of new type of waste, such as e-waste, which possesses tremendous detrimental effects to the environment, human beings and other living beings; stressing a pressing need for in-depth studies on waste management to avoid ecological destruction. The study of waste management from the governance lens offers a comprehensive understanding of the issue, as governance analyses do not only focus on the 'multitude of governance actors operating at range of scales' (Davies 2009: 157), but also allows for deeper apprehension of intricate interactions of these actors which are shaped by the complex combination of social, cultural, political and economic factors. Thus, it is timely that a research on waste governance is conducted.

Given the need to build a detailed understanding of waste governance, and bearing in mind time and resource constraints, it was decided to limit the study to one country – Malaysia (Figure 4.2) – and to focus on a particular set of governance actors in a particular field, namely e-waste. While the choice of Malaysia was in no small way determined by the fact that I am Malaysian, the

country does provide a highly appropriate context in which to address the aims of the research and explore the research questions.

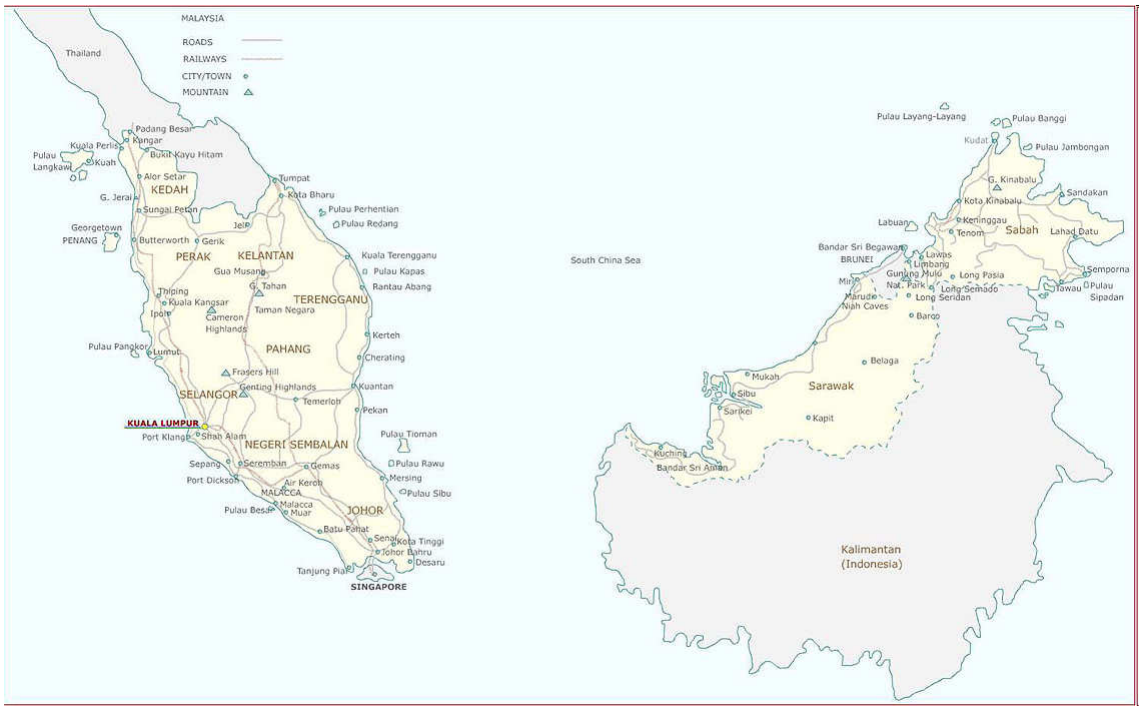



Figure 4.2: The map of Malaysia
(Source: http://www.ckten.com.my/images/map_malaysia.jpg)

According to Puckett (2005), Malaysia is one of the hot spots for traders and smugglers of e-waste. This is happening despite the fact that e-waste in Malaysia is theoretically controlled by both national and international laws. In addition, a number of non-state actors are becoming increasingly important and vibrant in the governance of environmental issues in Malaysia, a fact that may be partially associated with the country's burgeoning educated, middle class population and their rapidly transforming desires and priorities. Another important aspect that made Malaysia an appropriate choice for a case study is the existence of close links between the state and non-state actors. For example, many businesses in Malaysia are linked to politicians, political parties or the government, which sometimes is problematic in governance process.

A particular entry point for the research was the role of public-private partnerships (PPPs) in environmental governance. PPP is chosen to be the focus of this study as it allows for a clearer understanding of the roles of different actors of governance, as various actors work in collaboration instead of individually. Furthermore, PPP has been the focus e-waste governance study in other countries (such as the work of Renckens (2008) in the USA); thus providing an opportunity to compare how e-waste governance in Malaysia ranks relatively to the practice in other country. To ensure that information was captured in sufficient detail, I focused my study on two PPPs in two states on the Malaysian peninsula; Penang and Selangor. The state of Penang was chosen because it is one of the most developed states in Malaysia and has been dubbed the 'Silicon Valley' of Malaysia due to the concentration of electronic and electrical manufacturing companies in the state, with consequent high levels of e-waste generation. Selangor is the richest, most developed and most populous state in Malaysia, and was chosen because it is an industrial hub for the electrical and electronic equipment manufacturing, and also because of the presence of the Multimedia Super Corridor (MSC) which occupies a designated zone of approximately 15 x 50 kilometres square stretching from the Petronas Twin Towers to Kuala Lumpur International Airport (including the towns of Putrajaya and Cyberjaya).

### 4.2.4 Data Collection Methods: Interview, Observation and Review of Documents

The next important step in research design is to decide on the most appropriate data sources and data collection methods. Having analysed the three main qualitative methods namely interviews, observations and review of documents, I decided to adopt all the three methods to address the research questions, with interviewing being used as the main research tool.

The combination of these three methods was deemed the best approach to gathering the required data for the study due to their complementary strengths. For example, review of documents provides the background of the issue and helps in selecting potential respondents in the initial part of the research process, which is then followed by collection of detail data via interview method; the generated data are then cross reference for accuracy by adopting the combination of observation and documents review methods. By applying the mixed data collection method, the weakness of one method is overcome by other methods, thus increasing the quality of data produced; notwithstanding that each method possesses its own strength as describe below.

Interviews were chosen as the main method because of their ability to produce detailed, in-depth data (Arksey and Knight 1999). Interviews were conducted with key informants, those best informed on issues related to e-waste governance such as government officers (at federal, state and local levels), electrical and electronic equipment manufacturers, e-waste contractors (or e-waste recycling operators), scrap dealers, and representatives from relevant NGOs and CBOs (refer Figure 4.3 for categorizations of respondents and Table 4.2 for the number of respondents from each category). Their knowledge provided the depth of information necessary to explore and understand the topics under investigation. Interviews allow for a direct interaction between researcher and respondent; this means that data can be checked for accuracy and relevance as they are collected (Denscombe 2005), and this contributes to the validity of the data. Another reason why interviews were chosen as the main research method for this study was because of their convenience, in terms of response rate and flexibility. As all interviews are prearranged based on the respondent's convenience, response rates are generally high – as was also true in this case. Interviews are also quite flexible. Adjustments to the lines of enquiry can be made during the interview itself, allowing the researcher to make follow the most rewarding lines of questioning. The type of interview

used in this research was the in-depth, semi-structured interview, also known as open-ended interview.

The second main method used in this research was observation. Observation was chosen to complement the interviews. Observations allowed me to record what people did, and not just what they said they did, and thus served to cross-check the accuracy of the data obtained from the interviews. The third method adopted was review of documents; especially policies and legislation. This was because policies and legislation are major governance tools for state actors. As one of the objectives of this research is to examine the roles of state actors, the review of policies and legislation is clearly important. The sources of the data gathered through this method are permanently available and open to public scrutiny, hence contributing to their high validity. Besides that, it is also a less expensive method which complements and supplements the other two methods.

There are important ethical consideration connected with the collection and validity of data. In fact ethical issues are not only important during the data collecting phase, but throughout the whole research process including during the phases of data analysis and dissemination of findings to ensure that the thesis final report provides an honest, fair and unbiased account and does not negatively affect those who might have participated in the research. Advance consideration of the likely consequences of the participants taking part in the interviews was given high priority. To ensure that no key informants should suffer as a consequence of their involvement with the research, strict confidentiality and anonymity of respondents was guaranteed. To ensure that the interests of all parties are protected, respondents were informed of the objective of the interviews prior to each interview and informed consent was obtained from the respondents.

Validity of data is another concern. This is achieved by checking one interview transcript against other interviews to assess the level of consistency, and contacting respondents if necessary to check the accuracy or meaning of statements. Data derived from other methods such as document analysis and observation provided a back-up for the content derived from the interviews. Adopting different methods of data collection is a way to increase the validity and reliability of the data.

### 4.2.5 Analytical Technique: Thematic Analysis

Data in this research were analysed using the thematic analytical technique. Thematic analysis is a method for identifying, analyzing and reporting patterns within data which are not theoretically bounded (Braun and Clarke 2006). Braun and Clarke (2006) consider it as a poorly 'branded' (Braun and Clarke 2006:79) analytical method which is commonly used in qualitative methodology but is either claimed as something else or is not identified as any particular method at all. This procedure involves thorough searching across a data set to find repeated patterns of meaning and responses that fit the themes which have been prepared earlier.

Thematic analysis was chosen as the analytical technique in this research for several reasons. Firstly, due to its independence from any particular theoretical approach, thematic analysis is a flexible analytical tool and is able to interpret the research topic from various aspects (Boyatzis 1998), and hence has significant potential to generate unanticipated insights which might open up new perspectives on the topic under study. Furthermore, this technique has the potential to generate a rich and highly detailed explanation out of a complex data set (Braun and Clarke 2006). Secondly, thematic analysis has the ability to highlight similarities and differences across a data set, thus making it a highly appropriate tool to make comparisons between the two case studies in this research. Thirdly, Braun and Clarke (2006) claim that it is a useful tool for

producing qualitative analyses suited to inform policy development such as the study of governance.

## 4.3 Research Method

Once the research design was completed, this research moved on to execution. This stage of the research (which encompasses a series of processes) is labelled as research method. It is the process in which data were collected and analysed, to produce meaningful information that would add to knowledge. According to Mason (2002), research method is more than just a procedure for gaining data; it involves a combination of several intellectual, analytical and interpretive activities. I divide the discussion on research method into three parts; selection of respondents, data collection (or data generating methods), and data analysis, which are discussed in detail in the following sub-sections.

### 4.3.1 The Selection of Respondents

Based on the research design (where data collection methods have been determined) and the research questions, appropriate respondents were selected. Respondents for this research were chosen based on their roles in identified organizations (which are stakeholders of e-waste issue) and they were specifically approached as ‘key informants’. The process of identification and selection of key informants involved layers of categorizing. Firstly, the organizations (which the key informants are representing) in this study were divided into two main categories: state and non-state actors (termed governance actors), which were then sub-divided into more specific categories (refer Figure 4.3). Figure 4.3 illustrates the typology of these organizations which served as the base for the process of respondent selection.

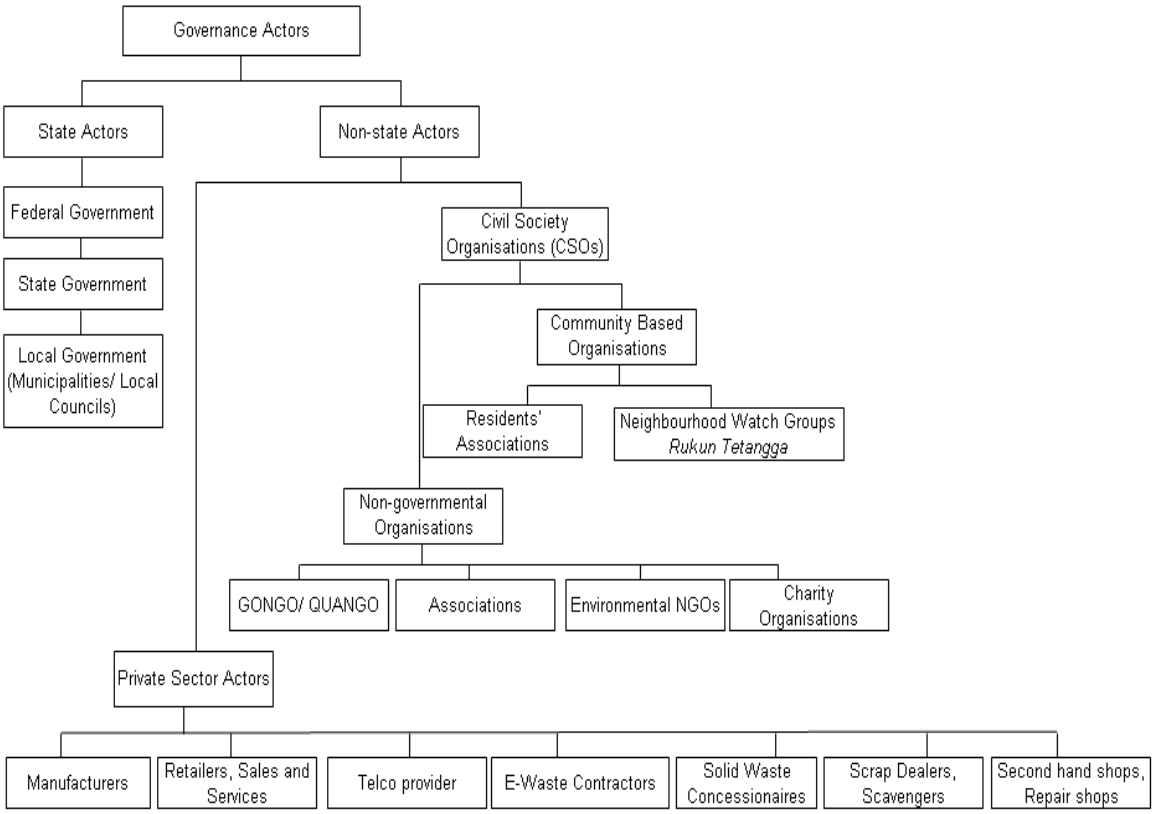



Figure 4.3: Typology of governance actors as used in this thesis.

Following the classifications as in Figure 4.3, and based on the background information which was gathered via an extensive desk study, a list of names and contact information of suitable respondents from each category was prepared. Samples were chosen based on their ability to help in understanding and illuminating the research questions. The list, however, was not considered as fixed. As the data collection process started, the list was expanded using the snowballing technique. Based on the list of selected respondents, the next stage (data collection) was started.

### 4.3.2 Data Collection

As noted above, three main data collection techniques were adopted in this research, namely: interviews, observation and review of documents, of which the interview was the most important. The data collection period of the research extended from the end of October 2008 to early April 2009. Selection of data gathering methods and data sources were guided by the research questions. A table connecting research questions to appropriate data sources and data collection methods was constructed (see Table 4.1) to make sure that the appropriate methods were used for each research question. (see Appendices 1 to 4 for samples of interview templates).

Table 4.1: Appropriate data gathering methods and sources are based on the research questions

| **Research questions** | **Data gathering techniques** | **Data sources** |
|---|---|---|
| Who are the actors of environmental governance in Malaysia? | • Review of documents | • Documents |
| How, why and with what implications are actors involved in environmental governance? | • Interview<br>• Review of documents<br>• Observation | • Key informants<br>• Documents |
| What and how significant are the roles of actors in different types of governing modes? | • Interview<br>• Observation | • Key informants |
| How, why and with what implications are state and non- | • Interview | • Key informants |

| Research questions | Data gathering techniques | Data sources |
|---|---|---|
| state actors working in partnership? | • Observation | |
| What is the most dominant and significant mode of governance? | • Interview<br>• Observation | • Key informants |

***Data Gathering Technique 1: Interview***

The in-depth interview was the main method used to gather data for this thesis. Through this method, the subjective views, experiences and knowledge of key players in e-waste governance was elicited. Altogether, a total of 56 interviews were conducted (of which two were follow-up interviews, and two were telephone interviews). Table 4.2 shows the number of respondents, arranged by category.

Table 4.2: The number of respondents and interviews conducted based on category of actors

| Category of actors | Level/type of organisations | Number of respondents | Number of interviews |
|---|---|---|---|
| State | Federal | 4 | 4 |
| | State | 1 | 1 |
| | Local | 3 | 4 |
| Non-state: Private sector actor | Manufacturer | 8 | 8 |
| | Retail, sales and service | 3 | 3 |
| | Telecommunication service provider (Telco) | 1 | 1 |
| | E-waste contractor | 5 | 5 |
| | Solid waste concessionaire | 2 | 2 |

| Category of actors | Level/type of organisations | Number of respondents | Number of interviews |
|---|---|---|---|
| | Scrap dealer, scavenger | 3 | 3 |
| | Used items and repair shop | 3 | 3 |
| Non-state: Community-based organization (CBOs) | Neighbourhood Watch (*Rukun Tetangga)* | 6 | 6 |
| | Residents' Association | 6 | 6 |
| Non-state: Non-governmental organizations (NGOs) | Quango/Gongo | 1 | 2 |
| | Association | 4 | 4 |
| | Charity | 2 | 2 |
| | Environmental | 2 | 2 |
| TOTAL | | 54 | 56 |

Overall, the number of respondents from the private sector actors constituted 46% of the total, followed by CBO at 22 %, NGOs 17% and government actors 15%. The larger number of respondents from the private sector was due to two reasons. Firstly, the involvement of private sector actors in e-waste related activities is very wide, ranging from the manufacturing process to repair and recycling activities. Secondly, I was struggling to get accurate and in-depth answers to my research questions from many of the respondents in the private sectors. This consequently forced me to seek out more respondents until sufficient data were collected, resulting in the high number of respondents from this group of actors, compared to others.

One important focus of my study is the public-private partnerships (PPP); and 16 out of 54 respondents were directly involved in two PPPs which formed the mini case studies in my thesis. The breakdown of these respondents in term of category of actor is given in Table 4.3.

Table 4.3: Breakdown of number of respondents who are involved in PPP, based on category of actors

| **Category of actors** | **Number of actors interviewed** |
|---|---|
| Government | 2 |
| Private sector | 2 |
| CSOs (CBOs and NGOs) | 12 |
| TOTAL | 16 |

The path to gathering data through the interview method began with contacting potential respondents based on the prepared list, as mentioned in the previous section. This was done in the first instance by telephone, followed by an official letter outlining the background and nature of the research. Follow-up telephone calls were made to enquire whether the potential respondents agreed to be interviewed and an appointment time, date and venue were confirmed. In instances where respondents asked for the interview questions, these were immediately emailed, and followed by a phone call to confirm that the email was received. The process was started about a month prior to commencement of my fieldwork, and was carried out until all respondents were interviewed. A great deal of time was spent on the phone and writing emails.

Prior to each interview, I made certain that ethical considerations were in place, such as being explicit about what I was doing. As much as possible, I tried to inform all respondents of my intentions; however in circumstances

where this was not feasible, respondents were informed after the interview (informed consent from them was obtained before the data were further analysed). For example, attempts to interview certain groups of potential respondents such as scrap dealers, scavengers, second-hand computer dealers and electrical and electronic equipment repairers were rejected at the first instance as I was mistakenly perceived as a newspaper reporter. For these groups, data were collected through informal conversational interviews where questions were generated spontaneously and without their even realizing that they were being interviewed. At the end of each conversation, I then explained that I was actually collecting data for my research and asked for permission to use their opinions for my work. This condition, which Descombe (2005) refers to as a 'debriefing session' is ethically acceptable. It is recognized in the vast majority of the codes of conduct published by professional association (Descombe 2005). This strategy worked as all respondents agreed with the condition that they must remain anonymous. Compared to the standardized and semi-standardized interview methods, this technique is less systematic; therefore data organization and data analysis are more difficult. Data capture is also trickier as conversations were not recorded. To ensure that data are fully captured, I recorded my reflections on the important points of the conversation in an audio recorder as soon as the conversation/interview ended and transcribed these as soon as possible.

In other interviews, open-ended questions were posed to interviewees, which were intended to evoke as much information as possible. A sample of interview questions can be found in Appendices 1 to 4. All interviews were conducted in a one-to-one manner, except for one interview with an international electrical equipment manufacturer which was attended by the director, who was the main respondent, accompanied by six assistants.

Due to differences in the nature of their involvement in e-waste related activities, and the diversity of educational background of the interviewees, the

approach to interviewing varied accordingly. Interview sessions with the head of government departments and bosses of private companies were mostly conducted using a standardized, open-ended interview schedule, where the exact wording and sequence of questions were determined in advance, and were read out during the interviews. However, in addition to the interview questions, I also kept a list of topics to be covered in each interview on a separate sheet which was used as a guide in questioning to increase naturalness and flexibility of questions and answers.

An interview relies extensively on the ability of an interviewer to balance the art of asking and listening and depends much on the observational and analytical skills of an individual (Creswell 2007, Descombe 2005, Arksey and Knight 1999). Recording the interviews has given me the advantage on being able to focus on quick analysis of the replies and framing questions for elaboration and clarification. Whenever consent from the respondents was granted, I recorded the interviews in an audio recorder, which has not only enabled me to capture the meaning from each interview effectively, but kept me focused on the interview without being too preoccupied with jotting down the responses. Seven out of eight respondents from the government departments, however, did not give their consent for the interviews to be recorded; no doubt because they were acutely aware that anything they said (which might be deemed to be critical) would probably result in them losing their jobs, and repeatedly reminded me that they should appear anonymous in my thesis. However, even where recording was permitted by the respondents, I still took notes, which I later found helped me tremendously in the analysis process.

Where recording was allowed, the quality of the recordings was ensured by making sure that recording device was tested beforehand, by speaking clearly and by ensuring that interview sessions were conducted with minimum noise in the background. Several precautionary steps were also taken such as taking

along extra batteries, and immediately uploading the audio recording into the computer system as backup files. Where time permitted, transcripts were prepared as soon as the interviews ended. This step assisted the process of making reflections and initial analysis which are not only crucial in identifying any points missed during the interviews but also proved to be useful in improving later interviews. Confusions which surfaced were clarified immediately with respective respondents via telephone. Subject to prior agreement with the respondents, several transcripts were emailed to respondents for confirmation and verification.

Although the interview sessions were successfully conducted, they were not without obstacles. The greatest limitation was to gain entry to the potential respondents and to persuade them to agree to an interview. It was very rare, especially with the government officers and private companies' heads, to agree to an interview after the first phone call. What normally happened was the gatekeepers – usually the secretary or personal assistance to the heads – did not allow me to speak to their bosses at the first instance. Instead I was commonly asked to email a formal letter indicating the reasons for the interview, which I duly did, or in some cases, was asked to contact another person, usually a lower ranking officer. This was then followed by another telephone call should no positive development occur after two weeks. The routine of making telephone calls, sending emails and waiting for the outcome were pursued four times, which took between about one month and a half to two months. In cases where the potential respondents agreed to be interviewed, an appointment was immediately made setting out the date, time and venue of the meeting. One of my attempts to secure an interview appointment with a director of a Japanese-based electrical device manufacturer took three months, as my interview questions were sent to the regional office in Singapore, and later to the head office in Japan to be vetted before permission was finally granted. The difficulties that I have encountered in getting the consent for interview from respondents in the government and private sectors may be an indication that

the issue of e-waste governance is so sensitive and these actors are not pleased to disclose related information to the public.

In circumstances where no positive reply was received after the fourth attempt, I considered the informant as not interested and did not proceed further. The lost opportunity to gather information from such people was compensated with materials available in the public domain such as from websites, and an alternative interviewee was sought as a replacement from the list prepared beforehand. Besides that, I also adopted another strategy which in most cases worked very well; which is mentioning the name of an important figure in the introductory phone call. This was possible as during the course of the research I managed to meet and exchange telephone numbers with several important people in government departments and industry during conferences that I attended. Many of them were very helpful in giving me the contact numbers of the appropriate person with the most information. Telephone calls which started with mentioning that 'I've got your number from Mr XY' always ended with a positive outcome. Once during a conference, I braced myself to relate to the head of a ministry about my difficulty in getting an interview with one of the directors, to which he reacted immediately by making a telephone call to the person and as a result an instant interview date was secured. Here I was trapped in an ethical dilemma where I have used the power of someone else to influence a potential interviewee into agreeing to be interviewed.

Having been given the opportunity for an interview did not, however, guarantee a smooth journey to the next step of the process. I was often spending (or rather wasting) a great deal of time waiting for people to appear, as many of the respondents were busy and important people in their organisations. In one instance, I arrived for a pre-arranged appointment with an important government officer at 2.00 p.m. and was asked to wait as he was summoned to see a minister, which I did until office-hours ended for the day at 5.30 p.m. A replacement interview was not possible as his diary was already

full, and the only option was to conduct a telephone interview via his mobile phone while he was being chauffeured to the airport for a work trip. Another thing which I found to be rather disappointing and which caused much delay in my working schedule was when agreed interview appointments were postponed or even cancelled at the eleventh hour, and on a few occasions I was only informed upon my arrival for the interview. To make sure that time was not wasted in such situation, I utilized it by working on the transcripts from previous interviews.

As my thesis is written in English, I prepared interview questions in English and planned to conduct interviews in English. However, things did not always go as planned in the field. As the Malaysian community is multi racial and multi lingual in composition, it is common for people to be well versed in several languages, or at least two languages; the national language which is the Malay language or *Bahasa Melayu* and English, with English being considered as a racially neutral language. Most Malaysian are comfortable speaking in a mixed of English and Malay Language, *bahasa campur* or *bahasa rojak* (a mixed of *Bahasa Melayu* and English language) in their everyday conversation. Therefore, even though I began asking questions in English, most respondents answered in *bahasa rojak* as a matter of habit, except the high ranking officers in the public and private sectors who were more proficient in English language. To this I reciprocated by phrasing the following questions in the same manner, which led to a fairly conversational and situational interview sessions. As a result, I noticed that the respondents became more relaxed, and subsequently willing to share more elaborated responses. I realised that this might have caused a loss or differences in meaning of the questions, and might have resulted in substantially different responses from the respondents. However, as this research is by no means trying to compare responses among different respondents, but rather is aimed at gaining as much information in breadth and depth, the differences were considered negligible.

***Data Gathering Technique 2 (Observation) and Data Gathering Technique 3 (Review of Documents)***

Another technique which was applied to obtain data for my research was observation. Unlike the interview method where the data gathered is mainly based on the perception of interviewees, observation produces data based on the observer's insights and perceptual sense, thus making me, the observer, the main 'tool' in this technique. There were two significantly different observation methods which I adopted in this research: firstly participant observation and secondly, non-participant observation.

I played my role as a participant observer by attending three related conferences and a partners meeting of a public-private partnership programme. To ensure maximum information could be gained from attending the conferences, elements worth noting such as any significant break through, policy changes, and related figures were determined beforehand. I kept a research diary to note down all my observations on the nature and intensity of the involvement of the various actors in the conferences, which was indeed a great help in forming a bigger and more general picture of my study as a whole in relation to my research. As there were also exhibition booths at the conferences, I took the opportunity to collect brochures, pamphlets, annual reports and many other relevant documents, and was fortunate enough to make new contacts from who I gathered a lot of information by engaging in informal, yet enlightening conversations. I also took the opportunity to talk to important people in the industry, government and NGOs during coffee breaks. This not only assisted me in getting their views on the research that I was conducting, but also proved to be a great 'lubricant' in gaining entry for the interviews later on, as noted above.

The non-participatory observation involved observing the process of collecting used computers at nine collection centres in Penang and Petaling Jaya in the

public-private partnership programmes, and three e-waste recycling plants. Each observation session lasted for about two to three hours. Details on date, duration and location of these observation sessions are provided in Table 4.4. The research diary is an invaluable tool in this process as it is not only used as a mean to keep record of the date, venue, time and duration of the observation sessions, but also to keep record of field notes which is very helpful in the data analysis phase.

Table 4.4: List of the dates, locations and duration of observation sessions

| **Date** | **Activity observed** | **Location of observation (state)** | **Duration of observation** |
|---|---|---|---|
| 27 February 2009 | e-waste collection in PPP collection centre | Selangor | 8.00 a.m. -10.30 a.m. |
| 28 February 2009 | e-waste collection in PPP collection centre | Selangor | 9.00 a.m. -12.00 p.m. |
| 1 March 2009 | e-waste collection in PPP collection centre | Penang | 3.00 p.m. - 5.00 p.m. |
| 3 March 2009 | e-waste collection in PPP collection centre | Penang | 9.00 a.m. -11.00 a.m. |
| 3 March 2009 | e-waste collection in PPP collection centre | Penang | 7.00 p.m. -10.00 p.m. |
| 5 March 2009 | e-waste collection in PPP collection centre | Penang | 7.00 p.m. -10.00 p.m. |
| 6 March 2009 | e-waste collection in PPP collection centre | Penang | 3.00 p.m. -5.00 p.m. |
| 1 April 2009 | e-waste collection in PPP collection centre | Selangor | 9.00 a.m. -11.00 a.m. |
| 3 April 2009 | e-waste collection in PPP collection centre | Selangor | 9.00 a.m. -11.00 a.m. |

| Date | Activity observed | Location of observation (state) | Duration of observation |
|---|---|---|---|
| 20 November 2008 | e-waste recycling process | Selangor | 10.00 a.m. -12.00 p.m. |
| 1 March 2009 | e-waste recycling process | Penang | 9.00 a.m. -11.00 a.m. |
| 4 March 2009 | e-waste recycling process | Penang | 10.00 a.m. -12.00 p.m. |

The main reason why observation was adopted was to check the validity of data from interviews against the 'reality' of the process of e-waste management, hence increasing the quality, validity and reliability of the data obtained. It was also meant to get first hand information and to fully understand the complexities of e-waste recycling, as there are limitations on how much can be learned from what people say in an interview. The observations have helped me tremendously in informing, contextualizing and verifying the information/materials gained from the interviews. They were also a very helpful way to gain sensitive information which might have be hidden by the respondents.

Besides the positive notes on observations, the very nature of this technique, in several instances, possessed some limitations as detailed below. Observations are both time and labour intensive, and at times can be expensive, for example paying the participating fee for conferences. Another issue regarding observations is writing field notes which can be a rigorous and demanding work. To ensure that all data are captured, as and when needed, I made full use of audio recording devices and recorded my spoken descriptions, which were later transcribed.

Materials for my thesis were also extracted from many documents which were collected before, during and after the field study period. Among the documents which have been analysed and have produced valuable information to the thesis are research journals, minutes of meetings, letters of communications between actors, policy statements and legislation, company profiles and annual reports, brochures, pamphlets, and leaflets. The greatest strength of this method is its non-reactive or unobtrusive nature of yielding excerpts or quotations from materials. As transcribing is not needed, this method is time saving. Furthermore, it gave me the freedom to access it and do the analysis at any time convenient to me.

### 4.3.3 Data Analysis

Data analysis is a procedure of making sense of the available raw data. It is a process which demands a high degree of intellectual ability such as creativity and analytical thinking. This process is interrelated and often goes on simultaneously with the data collection and report writing (Creswell 2007, Braun and Clarke 2006) (see Figure 4.4). The data analysis process for each individual research endeavour is unique, which Creswell (2007) claims is an art, and therefore cannot be rigidly defined (Kitchin and Tate 2000). Despite that, Creswell (2007) believes that data analysis process conforms to a general contour, which he describes as 'analytic circles' rather than a fixed step-by-step process which simply moves from one phase to the next. Creswell's 'data analysis spiral' (Creswell 2007: 151) consists of four general procedures as the followings;

- data managing
- reading
- describing, classifying and interpreting
- representing and visualizing

Kitchin and Tate (2000), while recognize that qualitative data analysis is an inductive process which is not easily captured by a linear process, offer a guideline which is intended for novice researchers which are spread into three iterative routes. They are represented in Table 4.5 below.

Table 4.5: Kitchin and Tate's (2000) guidelines on qualitative data analysis routes

| **Route** | **Procedure** |
|---|---|
| Description | Transcription<br>Annotation |
| Classification | Categorizing<br>Splitting and splicing |
| Connection | Linking and connecting<br>Corroborating evidence |

Based on Creswell's (2007) 'data analysis spiral', and Kitchin and Tate's (2000) guidelines on qualitative data analysis routes mentioned above, plus the work of Braun and Clarke (2006) and Marshall and Rossman (1999), I drew my own research analysis procedure. The data analysis process in my study spread out into four stages, where each stage consisted of several procedures with specific aims. The details of the analysis stages, phases, procedures and aims are condensed in Table 4.6 below, and followed by a narration on how each task was undertaken. These tasks, though presented in turn are not completely linear, with a good deal of back-tracking and iteration occurring between stages 2, 3 and 4.

Table 4.6: Details on data analysis adopted in this research

| Stage | Phase | Procedure | Aim |
|---|---|---|---|
| 1 | Data management | • Transcribing<br>• Organising data into folders and files | • Preparing data for analysis<br>• Familiarize self with data |
| 2 | Classification | • Repeated active reading and reflecting<br>• Annotating/memoing (noting down initial ideas)<br>• Generating categories/codes<br>• Coding | • Condensing and winnowing data in a systematic manner to produce meanings to the texts |
| 3 | Interpretation | • Identify patterns and themes<br>• Making links and connections<br>• Corroborate evidence | • Reducing data into themes<br>• Presenting data in a discussion |
| 4 | Representation | • Writing report | • Relating back the analysis to the research questions and literature<br>• Presentation of in-depth analysis output in qualitative narrative. |

The data analysis process can be represented in a flow chart as in Figure 4.4 below.

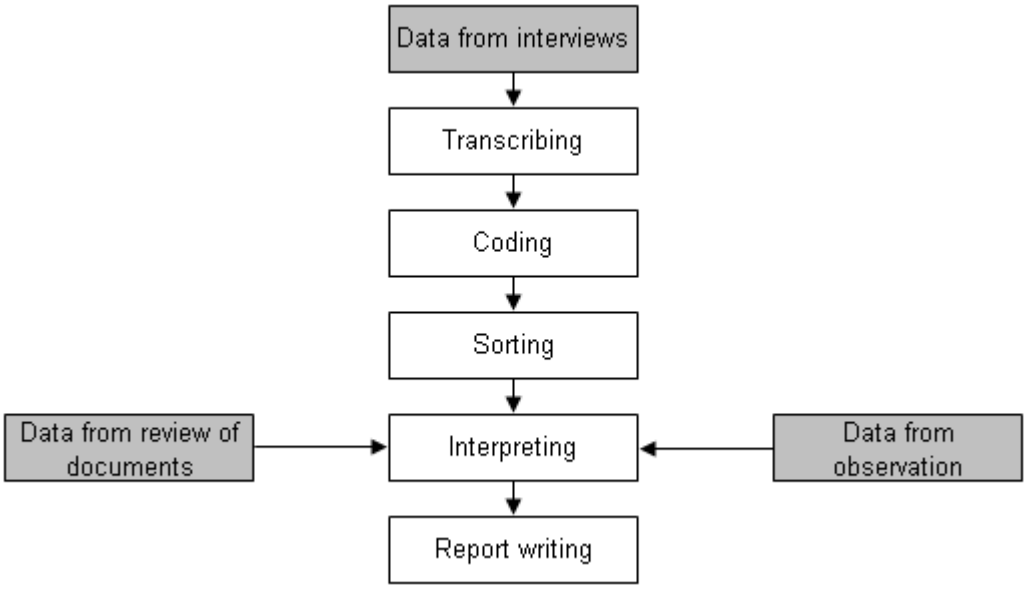



Figure 4.4: A flow chart of the data analysis process

***Stage 1: Data Management***

The route to obtaining meaningful information for my research began with the preparation for the transcription process. To start with, digital back up copies of original audio recordings were made, tagging them with a serial numbering system for easy reference. This was followed by the transcription process. Transcription is a process where raw data, whether in the form of pure description from observations and direct quotation from interviews in the audio format, are transformed into readable and printable texts. This involved careful listening to the audio recordings. Transcriptions of interview recordings were limited to spoken words only, as the thematic analysis technique which is adopted in this research does not require more detail than the spoken words in the transcript (Braun and Clarke 2006) and are verbatim for interviews which

were conducted in English. While undertaking this process, I found myself engaging in continuous repetition of the audio recordings to ensure data were captured precisely. As such, this process demands not only a great deal of hard work, but also consumed a great amount of time. Transcription work for interviews which were conducted in vernacular (Malay Language or *Bahasa Melayu)* or a mix of English and vernacular consumed twice the amount of time as they were transcribed as recorded before they were translated into English. It is possible that in this process some meaning might have been lost or, indeed, some twisted or invented. Out of 56 interviews, only 18 interviews were conducted fully in English language, while the rest were a mix of English and *Bahasa Melayu.* To increase the validity and reliability of the data, transcripts were sent to several respondents through email for their comments and to seek their approval.

This was then followed with the physical organising and sorting of all the print outs of interview transcripts, which at this particular stage had been transformed into material data, for further analysis. The transcripts were indexed with similar serial numbers as the audio recording tagging (see Appendix 5 for a complete list of the interview transcripts reference system). The entire sets of transcripts were read through before the coding process began. Ideas, comments, memos and identification of possible patterns, which were shaped as reading through was done, were written on the right-hand side margin of every page of the transcripts print outs which were purposely left blank. Writing notes and memos in the margins of the raw data served as a reminder about new thinking on facets of the investigation which were inspired during the reading process (Denscombe 2005). Besides that, the process of reading and rereading of transcripts also acted as a log of thinking lines which helped enormously with the process of generating categories.

The process of preparing transcriptions, reading and re-reading of transcripts is time-consuming, and at times, can be boring. However, as agreed by many

qualitative research authors (see Braun and Clarke 2006, Bird 2005, Riessman 1993), this process is an excellent way to start familiarizing oneself with the data. This phase provides the bedrock for the rest of the analysis (Braun and Clarke 2006) and is a key phase of data analysis (Bird 2005). As claimed by Braun and Clarke (2006), the time spent is not wasted, as it informs the early stages of analysis, and develop a far more thorough understanding of the data.

***Stage 2: Classification of Data***

The process of repeated reading of transcripts sits on the boundary of the first and second stages of the research analysis route. Thorough reading is necessary to note recurring patterns in the transcripts, to identify the important or more salient factors and to produce a general sense out of the data. It marks the beginning of the classification process. The classification of data, in simple terms, is a process where the raw data or the transcripts are broken up into parts and then placed into similar categories. This step begins with the task of generating categories, followed by the splitting of data and the coding process.

The categories used in my research analysis were a combination of prefigured or a priori codes (which were generated based on literature) and codes which were produced through data interrogating. Data interrogating is a process which involves asking a lot of why questions to the data. Apart from that, during the first reading of the transcripts, I was engaged in a deep, yet active intellectual process of questioning the data and reflecting on the conceptual framework which resulted in several sub-categories being added or expanded, while several others were collapsed. This is the most difficult phase in the analysis process. Marshall and Rossman (1999) describe categorizing as tough intellectual work which is complex and ambiguous, and demands a high level of creativity, but can be fun at the same time. Through the combination of these two processes, seven categories emerged, where specific codes were given to each category (see Appendix 6). These categories were used as a

guide structuring the writing up process. Not all the answers given by an interviewee are useful (Wolcott 1994). Only answers which respond to interview question count as useful or relevant data, while other data have to be discarded. After this process, a second level of categorization was carried out. The second level categorization process involved only the transcripts of respondents who are taking part in the Public-Private Partnerships (PPP) programme, and is meant to produce deeper and more detailed understanding and explanation for the PPP process. By adopting the same method of data interrogating as explained above, thirteen categories were produced, and were given specific codes (see Appendix 7).

Once the categories and category codes were ready, the transcripts were printed out again as the previous set were all marked with memos and comments. The transcripts were reread diligently, and chunks of text which were linked and connected to any of the prepared categories were highlighted with different coloured pens. The related codes were indexed on the right hand-side margin of the transcripts (see Appendix 8 and 9 for samples of coded transcripts). The process of organizing data into specific categories is known as the coding process (Tuckett 2005, Kitchin and Tate 2000). For parts of transcripts which were coded for more than one category, different types of identification were used, such as underlines.

After the coding process was completed, I proceeded with the next task which was to sort the data into categories. The process of organizing data into meaningful groups was done with the help of the cut-and-paste function of the word processor. At the start of this research process, I planned to use NVIVO (a qualitative analysis software) in the data analysis process. However, concerning that my lack of experience with the newly acquired technique may require more time and could possibly have an affect the accuracy of the data, and thus the results generated, I decided to opt for the ‘old’ technique which I am more familiar and comfortable with. To get on with the sorting process, a

specific file for each category was created, and relevant parts of the coded transcript or 'databits' (Kitchin and Tate 2000: 245) are cut and paste in the new file (see table 4.7). Kitchin and Tate (2000: 243) refer to the end product as 'sorted categories'.

Table 4.7: Example of a sorted category based on two transcripts

| **Category: Communication among partners in PPP (PPP Comm)** | | |
|---|---|---|
| **Databits** | **Transcript reference number** | **Respondents reference** |
| Most of the time, I call YY. Because normally I use my handphone to make calls. My mobile service provider cannot reach XX toll free number. | 42 | Respondent # 42, CBO, interviewed on 27 February 2009 |
| I will only call them to come down if I feel we have got a sensible amount. | 42 | Respondent # 42, CBO, interviewed on 27 February 2009 |
| We never meet in formal meetings. My tight schedule and heavy responsibility as a teacher in a school just wouldn't allow me to. However we frequently used other type of communication, via telefon and sms *(text messaging system)* for example. Anyway, our major partners such as XX and YY are based in Penang. Meeting up physically wouldn't be that easy. And whenever there are functions such as exhibitions we will meet. | 42 | Respondent # 42, CBO, interviewed on 27 February 2009 |

| **Category: Communication among partners in PPP (PPP Comm)** | | |
|---|---|---|
| **Databits** | **Transcript reference number** | **Respondents reference** |
| Normally Mr LLS of ZZ will sms or call us to inform of any progress or invite us for any function. For example, there are lucky draw competition carried out every year, and XX will normally follow-up by calling us up to ensure that we are kept informed and are invited. | 42 | Respondent # 42, CBO, interviewed on 27 February 2009 |
| We had a few meeting when we first start on the mechanism of the programme. Some were conducted here, others in Penang. We were also invited to visit XX and YY. After the programme was launched and is running smoothly now, then we just let it go on. There is no more meeting between us now. Now that the programme has sail off smoothly, we rarely meet. Once a month I met people from YY when they came over for collection. | 8 | Respondent # 8, Government, interviewed on 26 November 2008 |
| Communicating with XX can be quiet difficult. As a big organization with a regional office based in Singapore, deciding on simple things than take a long time. XX they have the corporate comm (*communication)* section. Everything must go through several levels. For example all | 8 | Respondent # 8, Government, interviewed on 26 November 2008 |

| Category: Communication among partners in PPP (PPP Comm) | | |
|---|---|---|
| **Databits** | **Transcript reference number** | **Respondents reference** |
| the speeches for our launching day have to be vetted by the legal department. Even, the publicity brochure has to go through their corporate comm. They check if logo correct or not. The colour correct or not. | | |

The remaining databits were sorted in the same manner, and the tables produced became the main source for the data interpretation stage that follows.

***Stage 3: Interpretation of Data***

Data interpretation is a stage consisting of several steps, and is aimed to make sense out of the data which have been collected. It begins as soon as data starts being gathered. The steps involved in the previous stage such as construction of categories, coding and sorting of data are interpretive actions and are the beginning of interpretation process. Other actions of data interpretation include establishing links between categories, and identifying similarities and differences among categories.

For example, one of the objectives of my research is to understand why different actors took part in partnership programmes. The chunk of information or databits related to this issue was put together in a table under the category 'reasons' and coded as 'PPP Re'. To make more sense out of the available data, I adopted the word matrix method based on suggestions by Creswell (2007), Yin (2002), Kitchin and Tate (2000) and Miles and Huberman (1994).

The word matrix displayed the five different sub-category of reasons (economy, environment, social, responsibility and others) as cited by the respondents against three groups of actors (Table 4.8).

Table 4.8: An example of a word matrix to interpret the reasons for involvement in partnership by different actors

| **Actors** | **Reasons for involvement in partnerships** | | | | |
|---|---|---|---|---|---|
| | **Economy** | **Environment** | **Social** | **Responsibility** | **Others** |
| Government | | X | X | X | X |
| Private Sector Actor | X | X | X | | X |
| CBO/NGO | X | X | X | | X |

The overall pattern in the word table led to the conclusion that all actors of governance took part in partnership programme for environmental and social reasons. State actors participation was also due to the needs oblige to their core responsibility, a reason which is not shared with other actors. On the other hand, both groups of non-state actors participated in the partnership programme due to the economic incentives derived from it; a reason which is not in the minds of state actors. The whole of the data were interpreted in this manner, which I found to be a real challenge as it relies heavily on my ability to think laterally and to connect data together in meaningful ways. The interpretation of data is then ready to be shared thorough written representation.

***Stage 4: Representation***

The essences of the study which were revealed from the analysis of the data were then communicated in qualitative narrative. In fact, the writing process began much earlier than the data analysis phase. Writing up began with jotting

down of ideas and potential coding schemes during the classification and coding of data. Like the research itself, writing is iterative (Kitchin and Tate 2000), and progressed in a nonlinear order (Braun and Clarke 2006). The process continues through the entire analysis process. My writing journey began with rough sketches which were gradually built up into drafts of chapters. I started drafting the three analysis chapters, followed by two chapters on literature review, and one chapter each on research methodology, conclusion and introduction.

## 4.4 Research Experience

In conducting this research, I realised that my biography – particularly my attachment with the University of Malaya and Durham University, and my ability to converse in Malay and English languages - have played an important role in establishing rapport with the various persons I met, in gaining entry permits and permission for interview sessions and in acquiring invaluable information which proved to be crucial for my research. As mentioned earlier in this chapter, getting permission for an interview was one of the biggest hurdles that I faced throughout the journey of completing the data collection process. This was however, made a little more manageable with my status as a staff member of University of Malaya – the oldest and most prestigious university in Malaysia. Notwithstanding that, once entry was granted, the fact that I am currently a student of a university in the United Kingdom helped break the ice in several interview sessions as many of the respondents have had their education in the United Kingdom. This particular similarity which I shared with the respondents often warmed up the atmosphere during the meeting. The respondents became more relaxed as a result, which was visibly shown in their altered body language and therefore become more forthcoming. I, therefore, juggled my biography as either a university student or university staff when the situation called for it.

A researcher's ethnicity is another important aspect in a multi racial and multi lingual country like Malaysia. As an ethnically Malay researcher, my proficiency in *Bahasa Melayu*, the national language, has enabled me to communicate well and interact easily with respondents, especially those from the working class such as the scavengers, electrical items repairers and electrical equipment retailer, who are able to converse in that language regardless of their race. I am also very fortunate for being able to communicate in English, which has helped me tremendously in communicating with the respondents at the managerial level upwards who mostly use English as a default language in their everyday job. Therefore, I conducted the interview sessions in the language (or a blend of languages) that I felt my respondents were more comfortable with.

As most people would naturally feel more comfortable and have a thicker sense of belonging while dealing with those from the same race, I experience a slight disadvantage in gaining access for interviews as a Malay, for many of the players in e-waste governance are ethnic Chinese. However, as my name Adeline is more commonly used among the ethnic Chinese rather than the Malays in Malaysia, on several occasions I was mistakenly assumed to be Chinese during introductory telephone conversations. This was indeed a blessing as it helped me to secure several interview appointments with Chinese respondents. I was also fortunate that despite my earlier worries, gender bias was not an issue at all in the process of getting data for my research. Instead, I felt that I gained respect from various people that I met throughout this research process as a married, middle-aged female student, which somehow made this research journey a smoother one.

## 4.5 Conclusion

This chapter aimed to elucidate the methodological routes which were adopted in this research. It began with a description of the research design, followed

with research method and ended with the narration of my experiences in conducting this study. The next step that followed was the data collection step, which was both physically and mentally challenging. Multiple methods of data enquiry - interviews, observations and review of documents - were adopted to allow the weakness of one method being covered by another, thus minimising the possibilities of bias in the final output. However, as data is filtered through a personal lens in qualitative research, it cannot escape personal interpretation. To summarise, this qualitative research on e-waste governance in Malaysia was carried out by adopting the case study approach with multiple methods of data collection, which were analysed using thematic approach. The decisions on research methodology, methods and analytical technique were made due to their abilities to investigate and interrogate the complex issue of e-waste governance and to fulfil the research objectives.

## Chapter 5: The Roles of State Actors in E-waste Governance

### 5.1 Introduction

The potential harmful effects arising from indiscriminate dumping and illegal dismantling have induced concerned stakeholders to become involved in e-waste governance – each actor acting with unique and specific roles. This chapter seeks to explore this matter; focusing on the roles of state actors. State actors in e-waste governance in Malaysia comprise of three levels of governments; the federal, state and local level governments. The questions that this chapter seeks to answer are: how do state actors play their roles in the governance process and what are the implications of state actors' involvement in overall e-waste management? This will be achieved by investigating the different modes of governance in which state actors are involved. The state actors of e-waste governing in Malaysia are involved in three modes of governance; the hierarchical mode, the persuasion mode and the co-governance mode. While the roles of state actors in the hierarchical mode is common, it is rather surprising that state actors are also involved in non-hierarchical modes of e-waste governance. The analysis of state actors role in hierarchical mode of governance is presented in Section 5.2, followed by their roles in the persuasion mode in Section 5.3.

Two major roles of state actors in the hierarchical mode of governance are to formulate law and to enforce the formulated law. The analysis of the hierarchical roles of state actors (Section 5.2) begins with a description of the Department of Environment (DOE) as the responsible federal government agency in governing e-waste. This is followed by a discussion of the evolution of law on e-waste, a critical discussion of its limitations, the implications of the implementation of the law, and finally possible avenues for improvement. The discussion in Section 5.3 is focused on the role of state actors in the persuasion mode of governance. State actors (federal level government) are involved in

persuasion mode of governance in a campaign on mobile phone recycling. A detailed discussion of this programme and the state actors' roles are reported in Section 5.3.

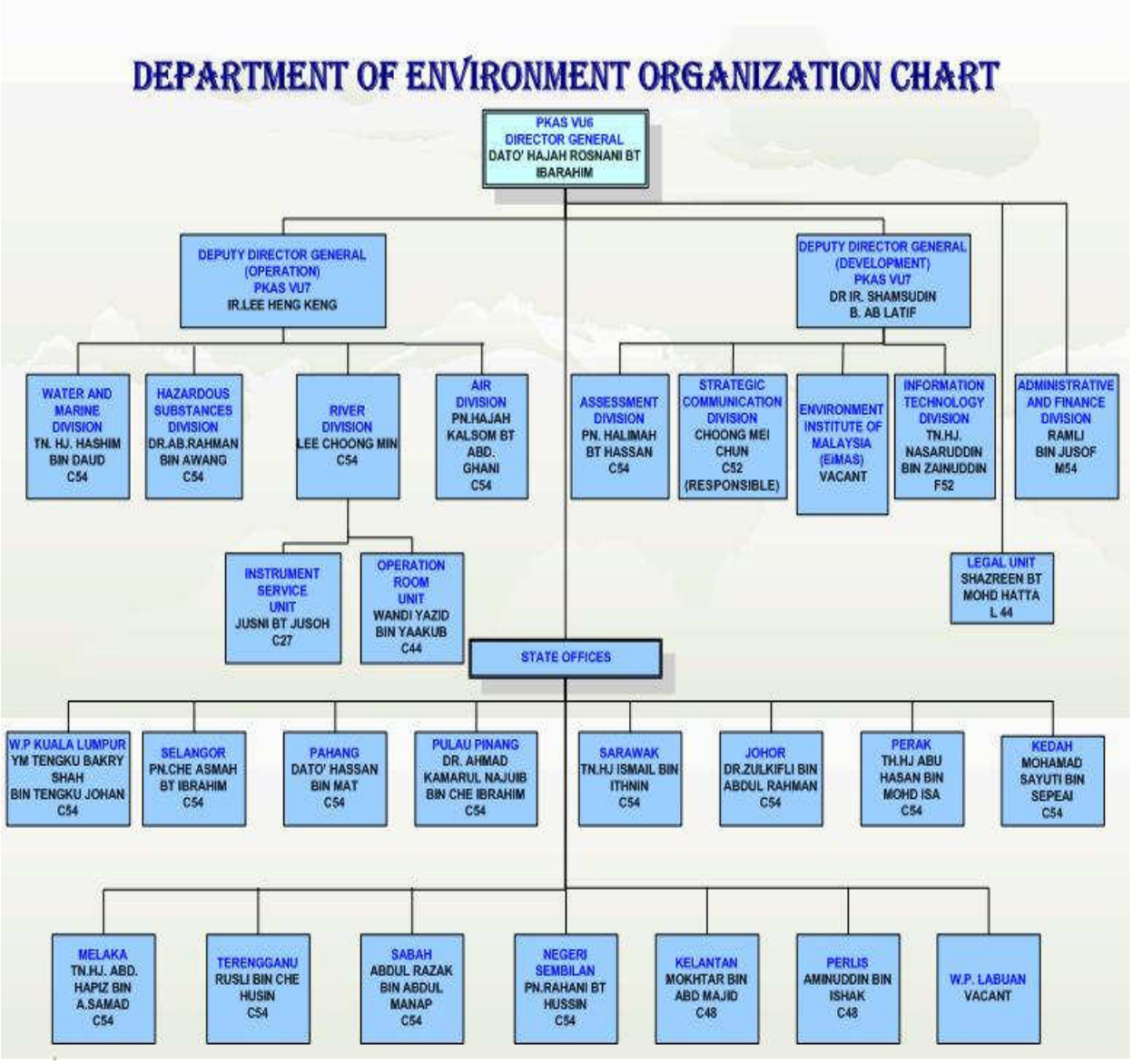
## 5.2 The Hierarchical Mode of Governing E-waste

The hierarchical mode of governance displays a 'top-down' character where the governing bodies are (or see themselves as) in some way 'superimposed' above those governed (Kooiman 2003 : 115). In hierarchical mode, command-and-control is applied, often with sanction, to achieve a specified objective. As such, and as mentioned in the introduction to this chapter, there are two main roles for state actors in hierarchical mode of e-waste governance; firstly to formulate relevant law and secondly to implement the law. These roles are played by the federal government, particularly the Department of Environment (DOE). A brief background of DOE in terms of its history, organisation of staff, overall function and specific roles in governing e-waste is briefly provided in the following paragraphs.

The DOE was established in 1974 as a small division under the Ministry of Local Government and Housing, and was known then as the Division of Environment (Hezri and Hassan 2006). It was moved from the Ministry of Local Government and Housing to the Ministry of Science and Technology in 1976 (the Ministry of Science and Technology was renamed the Ministry of Natural Resources and Environment in a major cabinet reorganisation in March 2004). Following a restructuring exercise in 1983, the Division was upgraded to Department status and is now officially known as the Department of Environment (DOE). The head office of the DOE is in Putrajaya, and it has twenty-six branches nationwide (www.doe.gov.my). From an administrative perspective, the DOE is headed by a Director General (see Figure 5.1 on the organisation structure of the DOE). The Director General of the DOE is appointed by the minister, and has extensive administrative powers, which

among others include the power to approve licences, charge fees and fines, prohibit activities, prosecute transgressors and make subsidiary legislation. All subsidiary legislation made under the EQA (known as regulations, rules or orders) have to be approved by the minister of Ministry of Natural Resources and Environment, after consultation with the Environmental Quality Council members.

The main function of the DOE is to prevent, control and abate pollution in Malaysia through administering and enforcement of Environmental Quality Act 1974 (EQA 1974) (www.doe.gov.my). EQA 1974 is Malaysia's only piece of environmental law. It is mainly a regulatory instrument for pollution control, and does not cover other, broader environmental issues. EQA 1974 received Royal assent from the King on 8th March 1974. It was gazetted on 14th March 1974 and came into operation on 15th April 1975. The provision on e-waste management in the EQA 1974 is found in Section 34B (Prohibition against Placing, Deposit, etc. of Scheduled Wastes), and in a subsidiary law (which was made under EQA 1974 called 'The Environmental Quality (Scheduled Wastes) Regulation 2005'). The administration and enforcement of laws on e-waste is placed under the responsibility of a unit called the Hazardous Substances Division. This unit receives support from three other units under the DOE; the Strategic Communication Division pertaining to issues relating to the raising of public awareness and education, the Environmental Institute of Malaysia (EiMAS) for training purposes, and a Legal Unit to deal with legal matters and any prosecutions that might be brought under the law (see Figure 5.1).




(Source: Department of Environment – www.doe.gov.my)

Figure 5.1: Organisational structure of the DOE Malaysia (as at November 2010)

### 5.2.1 E-waste Legislation: Emergence and Evolution

E-waste was first legally recognized as a type of hazardous waste in Malaysia on 15th August 2005, when a provision on the control of pollution caused by e-waste generation, storage, treatment and disposal came into effect. The introduction of e-waste law in Malaysia came relatively late considering the significant amount of e-waste generated in the country. Malaysia is one of the leading sites for the global electronics industry, involving the assembly, testing and packaging of semiconductors (MIDA 2004 – www. mida.gov.my), and is a hot spot for e-waste recycling activities (Lee 2007). Although e-waste law in Malaysia was introduced in 2005, the root of e-waste legislation can be traced back to the introduction of the law on hazardous waste in 1979.

The progress or evolution of Malaysian e-waste policy can be divided into four phases with prominent milestones in each phase. The progress has been influenced by various factors, such as global trends in environmental governance where intervention of third sector actors proliferate, changes in national level economic activities, responsibility as a party to international treaties, and international relations. The four phases and their significant milestones in e-waste policy development in Malaysia are presented in Table 5.1. This analysis provides the background information towards understanding the involvement of state actors in e-waste governance in Malaysia.

Table 5.1: The four phases of evolution and key milestones in Malaysian legislation on hazardous waste management

| Phase | Period | Milestones/ significant events | Influencing factors |
|---|---|---|---|
| 1 | 1979-1988 | Environmental Quality (Sewage and Industrial Effluents) Regulations 1979. Enacted on 1st January 1979. | The institutionalization of environmental policies at the global level. |
| 2 | 1989-1995 | Environmental Quality (Scheduled Wastes) Regulations 1989 was introduced. | To ensure safe disposal and management of hazardous waste. |
| 3 | 1996-2004 | Environmental Quality Act 1974 amended. Provision on the control of hazardous waste included in Section 34B. | To address the international commitment to the Basel Convention. |
| 4 | 2005- now | Environmental Quality (Scheduled Wastes) Regulations 1989 was revoked and replaced by Environmental Quality (Scheduled Wastes) Regulations 2005. E-waste is prescribed as a type of hazardous waste. | The proliferation of the third sector in environmental governance; international relations, the influence of international treaty and foreign countries' laws |

***Phase 1 (1979-1988)***

The first phase in e-waste policy development began with the introduction of the first legislation on hazardous wastes known as the Environmental Quality

(Sewage and Industrial Effluents) Regulations 1979 (made under EQA 1974), which was promulgated on 1st January 1979. The introduction of this piece of legislation was a response to a new wave of environmental management where institutionalization of environmental policies at the global level proliferated. Janicke and Weidner (1997) identify two broad waves of institutionalization of environmental policies at the global level. The first wave occurred in the late 1960s to early 1970s, pioneered by frontrunners in the developed world, such as the USA, Sweden and Japan, and the second wave came in the aftermath of the Brundtland Report in 1987 and the Rio Conference of 1992. Malaysia responded to the first wave by making various administrative and legal changes including the establishment of a ministry for the environment and a national environmental law (Hezri and Hasan 2006), which brought forth the Environmental Quality Act (EQA) in 1974, discussed above. The Environmental Quality (Sewage and Industrial Effluents) Regulations 1979 called for restrictions on the discharge of effluents and disposal of sludge on any soil or surface of any land without the written permission of the Director General of Environment (www.doe.gov.my). The aim of this provision was to avoid indiscriminate disposal of hazardous industrial waste on land and to avoid pollution of land and water. Indiscriminate disposal of hazardous waste is not only detrimental to the environment and human health, but also requires costly clean up measures (Lee 2006).

***Phase 2 (1989-1995)***

The second phase began in the late 1980s and was triggered by changes in national economic activities. At that time, Malaysian economic activities were restructured away from agricultural activities to industrial activities, resulting in the production of a more complex type of waste and making waste management more complicated. To ensure that proper measures for managing hazardous waste were in place and the environment and public health were protected and to align legislation with the transformations in economic activity, the government constantly and progressively reviewed the law – a process

which continues to this day. This culminated in the formulation of three sets of regulations related to hazardous waste management in 1989, namely:

- Environmental Quality (Scheduled Wastes) Regulations 1989
- Environmental Quality (Prescribed Premises) (Scheduled Wastes Treatment and Disposal Facilities) Order 1989
- Environmental Quality (Prescribed Premises) (Scheduled Wastes Treatment and Disposal Facilities) Regulations 1989

The introduction of these by-laws marked the second phase in the progress of e-waste law in Malaysia. It was in these by-laws that the term 'scheduled wastes' was first used in Malaysian law to refer to hazardous waste. These by-laws aim to control indiscriminate and illegal dumping of hazardous waste by tracking the movements of waste from the point of generation to disposal facilities using consignment notes. The main target of this law is industry.

***Phase 3 (1996- 2004)***

The third phase of e-waste policy evolution saw a very significant advancement in Malaysia's hazardous waste legislation. In this phase, the EQA 1974 was amended in 1996 to include Section 34B (Prohibition against placing, deposit, etc. of scheduled wastes). The enforcement of this law resulted in the prohibition of these activities:

- Placement, deposit or disposal of any scheduled wastes on land or into Malaysian waters except at prescribed premises;
- Receive or send scheduled wastes in and out of Malaysia, and
- Transit of scheduled wastes.

(source: Environmental Quality Act (1974) (Act 127) from www.doe.gov.my).

The amendment was carried out as a commitment to fulfilling Malaysia's obligations as a party of the Basel Convention. Malaysia's first step to becoming a member of the Basel Convention took place on 8th October 1993, when Malaysia deposited the instrument of accession to the Basel Convention. It came into force in Malaysia on 6th January 1994. This proved to be a turning point in hazardous waste legislation and management in Malaysia. A more stringent provision and stiffer penalties were introduced in the newly amended law. The penalties for illegal trafficking of hazardous waste were increased to RM500,000 (£100,000) or five years imprisonment, or both. Despite stringent requirements, the law provides an avenue for importation and exportation of e-waste by obtaining written approval from the Director General of the DOE.

***Phase 4 (2005-present)***

The most significant milestone in e-waste policy evolution was reached in 2005, when e-waste was finally legally defined as a type of hazardous waste. This was achieved with the introduction of Environmental Quality (Scheduled Wastes) Regulations 2005 which came into force on 15$^{th}$ August 2005. This piece of legislation replaced the previous Environmental Quality (Scheduled Wastes) Regulations 1989 which was revoked. It emphasizes pollution abatement and control through the implementation of waste treatment and disposal schemes, and encouraging waste minimization. This is clearly manifested in the key provisions of this regulation which focus on the generation, storage, treatment, disposal and tracking of movements and transportation of hazardous wastes. Generation of wastes is controlled by a notification system which requires waste generators to notify the DOE of the types and amount of waste that they have generated or stored. Storage of waste is limited to less than 20 metric tonnes for not more than 180 days. Full responsibilities of e-waste generators and contractors are provided in Appendix 10.

The law also specifies that storage, treatment and disposal of hazardous waste should only be undertaken at specific premises called 'prescribed premises' (noted in regulations 4, 5 and 6 of the law). Three premises are listed as prescribed premises: off-site storage facilities, off-site treatment facilities and off-site recovery facilities (Environmental Quality Act 1974 (Act 127) from www.doe.gov.my). The term used under this law to refer to e-waste recycling plants is 'off-site recovery facilities', which is divided into two categories; partial recovery and full recovery premises. As of July 2010, there were 138 registered premises, of which 122 were partial e-waste recovery premises and 16 were full recovery premises (see Table 2.9) (www.doe.gov.my). Partial recovery refers to the process of collecting, segregating, dismantling and crushing of the equipment, where the recovered materials will need further treatment and recovery before final products are produced (Respondent # 4, interviewed on 3 September 2009), while full recovery is a complete chain of processes starting with the dismantling of e-waste and recovery of precious metals, through to final disposal of treated hazardous waste.

The law specifies that the owners of prescribed premises should obtain a licence. To obtain a licence, the owner of the prescribed premises must make an application to the DOE for a fee, based on the Polluter Pays Principle. The fee payable is determined following an assessment and evaluation of several factors including class of premises, location of premises, quantity of waste discharged, class of pollutants discharged and the existing level of pollution. The licencing measure is meant for easy monitoring of waste generation and movement. These licences were sceptically nicknamed 'licences to pollute' by a representative of an NGO (Respondent # 53, interviewed on 4 March 2009). Any person who is found guilty of occupying or using premises without obtaining a licence shall be liable to a fine not exceeding RM50,000 (£10,000) or imprisonment for a period not exceeding two years, or both, and to a further fine of RM1,000 (£200) for every day that the offence is continued.

Another major amendment in the new law is the introduction of a new categorisation system of waste. The new system categorised hazardous waste into five categories (coded SW1 – SW5), based on type of waste, and not the source of waste as in the previous law. The new categories of scheduled wastes are:

- SW 1 Metal and metal-bearing wastes,
- SW2 Wastes containing principally inorganic constituents which may contain metals or organic materials,
- SW3 Wastes containing principally organic constituents which may contain metals or organic materials,
- SW4 Wastes which may contain either inorganic or organic constituents, and
- SW5 Other wastes.

E-waste falls under the SW1 category. This new system contributes to more effective waste management as the type of waste is the key factor in determining suitable management solutions, not the source of the waste. The new categorisation system is also in line with the system used in the Basel Convention (Lee, 2006).

There were many factors responsible for the processes leading up to the formulation of this new law. The three main factors were international pressure, the influence of international and foreign countries' law, and the role of non-state actors. The effect of international pressure is apparent in an incident narrated by Ir Lee Heng Keng, the Deputy Director of Department of Environment in a speech to a Waste Management Conference in Kuala Lumpur in November 2008. According to Ir Lee Heng Keng, a ship laden with used computer monitors en-route from Malaysia to China was stopped in Hong Kong waters in 2005. Malaysia's DOE received a call from Hong Kong's Environmental Protection Agency (EPA) questioning Malaysian action in the

matter as Malaysia is a party to the Basel Convention which restricts transboundary movements of waste. The incident - which tarnished the image of the country at international level and affected international relations – created the impulse for a quick formulation of an e-waste law. As a result, the Environmental Quality (Scheduled Wastes) Regulations 2005 was introduced, rather hastily, to replace the Environmental Quality (Scheduled Wastes) Regulations 1989.

The second factor that has had an impact on the formulation of Malaysian law on e-waste is the influence of international law and foreign countries' law. In managing the issue of e-waste, Malaysia has attempted to be on a par with the international agenda and tried to work in tandem with international efforts (Ibarahim 2006). This was confirmed by one of the directors of the DOE in an interview:

> "International laws play an important role in the process of formulation and review of our law on e-waste. Basel Convention and EU laws are used as guidelines. We did this to make sure that we are always in line with the international law…..in line with the current progress at international level" (Respondent # 1, Government, interviewed on 27 November 2008, verbatim).

The influence of the Basel Convention in Malaysian e-waste law is evident. For example, the wordings used in the definition of e-waste in both laws have many similarities. E-waste in the Basel Convention (List A, Category A1, Code A1180) is defined as:

> "waste electrical and electronic assemblies or scrap containing components such as accumulators or other batteries included in list A, mercury switches, glass from cathode ray tubes, or other activated glass and PCB (polychlorinated biphenyl) capasitors, or contaminated with

> Annexe I constituents (for example, cadmium, mercury, lead, PCB) to an extent that they posses any of the characteristics contained in Annexe III' (Basel Convention website, available at www.basel.int).

Under Malaysian law, the definition of e-waste (in the First Schedule of Environmental Quality (Scheduled Wastes) Regulation 2005 under Category SW 1 (Metal and metal-bearing wastes), code SW110) is given as follows as:

> "waste from the electrical and electronic assemblies containing components such as accumulators, mercury-switches, glass from cathode-ray tubes and other activated glass or polychlorinated biphenyl capasitors, or contaminated with cadmium, mercury, lead, nickel, chromium, copper, lithium, silver, manganese or polychlorinated biphenyls" (Guidelines for the Classification of Used Electrical and Electronic Equipment in Malaysia, available at www.doe.gov.my).

From this text it is clear that the definition of e-waste under Malaysian law is lacking with respect to the definition and clarification of the boundary between e-waste (for disposal) and used electrical and electronic equipment (for reuse and refurbishment). In order to clarify such grey areas, a guideline was published by the DOE entitled 'Guidelines for Classification of Used Electrical and Electronic Equipment in Malaysia' (to be read together with Environmental Quality (Scheduled Wastes) Regulations 2005), which took effect on 15 January 2008. Among other things, this guideline clarified that any electrical or electronic equipment which is less than three years from the date of manufacture and is intended for direct re-use is not considered as e-waste and can be imported or exported.

Another factor which has been significant in shaping e-waste policy in Malaysia is the role of NGOs. Two locally registered NGOs which are particularly concerned with issues related to e-waste are the Consumer Association of Penang (CAP) and Sahabat Alam Malaysia (SAM). SAM is a

national NGO affiliated with Friends of the Earth International. Both NGOs have worked very closely with international like-minded organizations such as the Basel Action Network (BAN), Global Anti Incinerator Alliance (GAIA) and International POPS (persistent organic pollutants) Elimination Network (IPEN), and have gained broad exposure and knowledge on e-waste from their involvement with these international groups. Inspired by the experience of such international organisations (Respondent # 49, 13 November 2008), these NGOs started to lobby the government for an e-waste law by writing letters to the Director General of the DOE. CAP, for example, has a high level of concern over the issue of justice for the workers who are involved in dismantling of e-waste, as many workers have to take up such employment because of extreme poverty despite the health risks that they are facing. Many of the workers are international migrants from India, Bangladesh and Myanmar. The NGOs pressured the government to introduce and implement laws to ensure that e-waste recycling is carried out in an environmentally sound manner that is safe for both the environment and people (workers and general public). In this case, CAP's actions are inspired by the BAN's investigation in Guiyu, China (Respondents # 49, 13 November 2008). CAP is also lobbying for a law to halt the import of e-waste to Malaysia to avoid the country becoming an e-waste dumping ground as has happened in several other countries in the Global South, unless safe e-waste recycling technology is in place.

The above discussion and analysis of the evolution of Malaysian law on hazardous waste control over the last thirty years demonstrates that the DOE has actively played its role as the policy maker in ensuring the relevancy of the law in controlling the negative impact of hazardous waste to the environment and society. That said, it is worth noting that the latest version of the law - the Environmental Quality (Scheduled Wastes) Regulations 2005 – materialised due to pressure from inside and outside of the country, including the need to fulfill Malaysia's obligations as a party to the Basel Convention. The concept

of multilevel governance where authority and power are dispersed beyond a sovereign state (which is known as Type I governance in Hooghe and Marks (2003) and multiple tiers of authority by Betsill and Bulkeley (2006)) is evident in this case.

An almost similar situation (where internal and external pressure, coupled with the responsibility to fulfil its obligations as a party of the Basel Convention have shaped the formulation of law) is also happening in China. A study by Zhang (2009) on e-waste governance in China reveals that pressure from foreign countries and international environmental NGOs, have resulted in the restructuring of e-waste recycling operations by the Chinese government via promulgation of laws since 2001. Notwithstanding the introduction of new legal provisions, in both Malaysia and China e-waste continues to be a source of hazardous waste pollution as cases of indiscriminate dumping and informal dismantling are still widespread (evidence from Malaysia are provided in Plates 5.1 to 5.6). This mismatch could be due to a combination of factors such as loopholes in the content of the law and/or weaknesses in the implementation of the law. The following section, therefore, turns to discuss the limitations of the hierarchical mode of governance in Malaysia.

### 5.2.2 The Limitations of the Hierarchical Mode in E-waste Governance

A successful hierarchical mode of governance depends significantly on the roles played by the state actors as the major players in ensuring the creation of an effective legal framework and its efficient implementation In controlling pollution emanating from improper management of e-waste, the hierarchical mode of governance which has been adopted by the federal government of Malaysia has shown limited success as cases of improper disposal are still widespread (as evident in Plates 5.1 to 5.6). This is substantiated by the findings of two pieces of research undertaken in the state of Selangor; by Othman et al. (2004) in Mukim Hulu Langat and Kalana (2010) in Shah Alam

(the capital city of the Selangor state). In the surveys conducted by Othman et al. (2004), they found that 40% of residents interviewed opted to dispose of their e-waste together with normal household waste while Kalana (2010) reports a slightly reduced percentage of such action (disposing of e-waste together with other household wastes) at 30%. In both studies, similar reasons was cited by the respondents for their decisions (to dispose of e-waste together with normal household wastes); namely, a lack of information (and facilities) about the correct way of disposing e-waste. Interviews with the public to ascertain how they dispose of their e-waste were conducted by the New Straits Times newspaper (published on 13 July 2009), and comments such as 'I discard my e-waste at the same place I throw my domestic waste' and ' I give them away to scrap collectors' are among those voiced by the respondents. This indicates that the available law formulated and variably enforced by the state has not provided a total solution to e-waste management. This might due to several limitations which lie in both the content of the law and in its implementation. It is to these limitations to which the chapter now turns.

Plate 5.1: Backyard dismantling of personal computers (PC). (Source: author)

Plate 5.2: Backyard dumping of television sets. (Source: author)

Plate 5.3: Dumping of e-waste at the backyard of an electrical repair shop. (Source: author)

Plate 5.4: Illegal dumping of e-waste at the road side. (Source: author)

Plate 5.5: E-waste is mixed with other scrap at a scrap dealer storage yard. (Source: author)

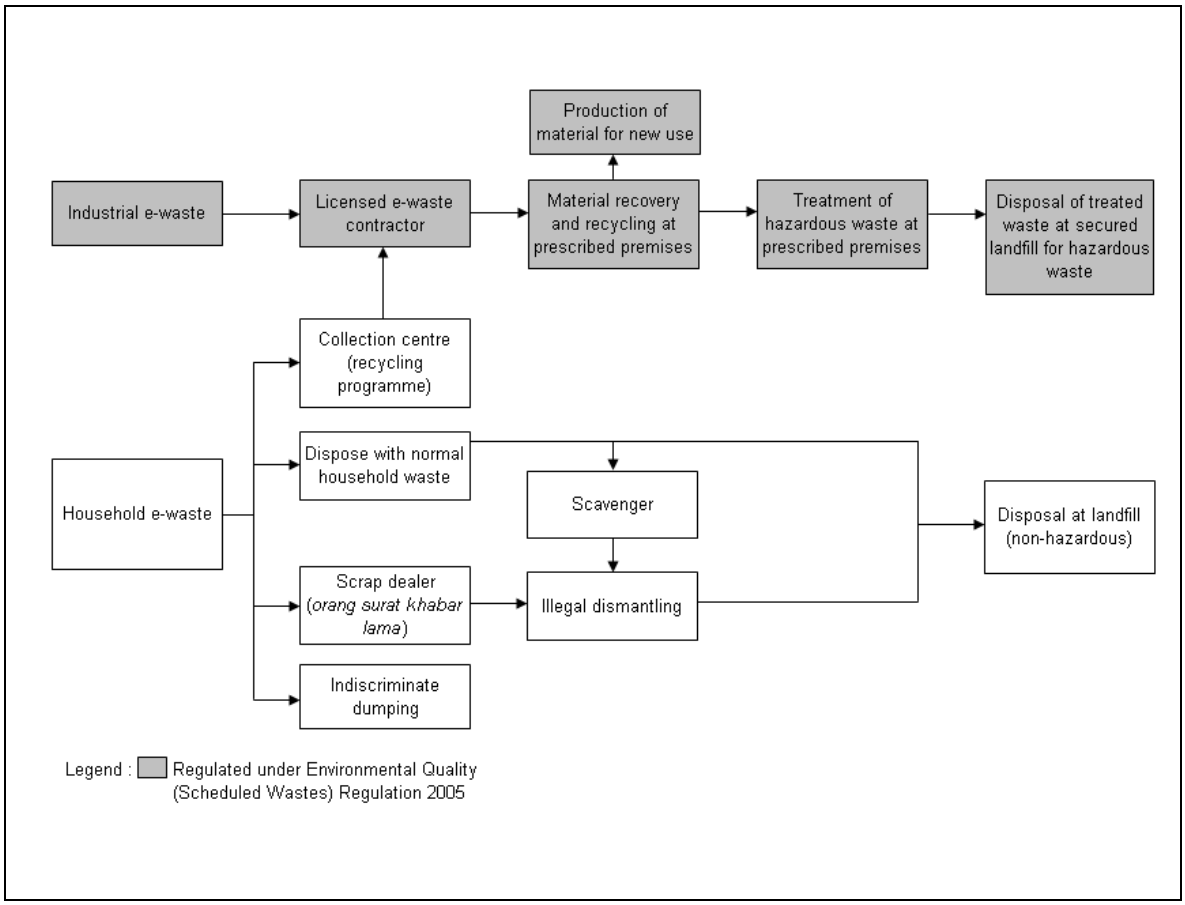
Plate 5.6: Indiscriminate dumping of electrical bulbs. (Source: author)

***Limitations in the Content of the Law***

The Environmental Quality (Scheduled Wastes) Regulations 2005, as mentioned above, was introduced rather hastily due to mounting pressures from inside and outside of the country, and was much inspired by laws adopted in other countries, which might not be suitable for application in Malaysia. There are two areas regarding the content of the law which limit the potential

for an effective hierarchical mode; firstly, it overlooks some important players in the e-waste industry, and secondly it provides avenues for exemptions from complying with the law by obtaining written permission from the Director General.

The first weakness of the law concerns the exclusion of relevant players in e-waste management. As illustrated in Figure 5.2, generation of e-waste in Malaysia comes from two sources – the industries and the households; and while e-waste from industrial sources enters the formal stream of management, those generated by the households may enter the informal e-waste management stream. Although the players in e-waste management in Malaysia are so diversified, the law identifies only two major players; industrial e-waste generators and formal e-waste contractors (who are involved in the process of collecting, transporting, dismantling, recycling, treating and disposing of e-waste in formal recycling industry), and neglects the generation of waste by households and small companies as well as informal recycling activities.




(Source: author)

Figure 5.2: The e-waste stream from industrial and household sources

Under Malaysian e-waste law, an e-waste generator is defined as 'any person who generates scheduled wastes'. However, the Environmental Quality (Scheduled Wastes) Regulations 2005, including Regulation 15 (on the conduct of training), second schedule (on waste notification), fifth schedule (on inventory) and sixth schedule (on consignment notes), implies that this law is meant for large industrial concerns only. Any person who wishes to generate more than 20 metric tonnes of e-waste is required to apply for a licence from the DOE, and to notify the Department of the amount of e-waste generated within 90 days. As such, small companies and households are not subjected to this law as the amount that they generate is within permitted limits. This has

brought significant consequences as the amount of e-waste generated by households (although relatively little individually) has a tremendous cumulative effect.

Besides that, the law may also not be as a useful a tool to control pollution from the generation of e-waste by industries as appears on first sight. This is because many of the industries already have more stringent in-house policies related to e-waste control. Manufacturers, especially Multi National Companies (MNCs), are governed by their own policies which are stricter than the EQA and were in place even before the national law was introduced. By adhering to their internal policies, they seemed to be complying to the EQA at the same time. A respondent working with a USA-based microchip manufacturer in Georgetown, Penang said that the company has been conforming to its internal policies on e-waste control which are stricter than the EQA, as they have to protect the specific code number of their products from falling into the hands of their competitors, long before the government's law came about.

> "We have a general policy on environmental protection called the XXX Green commitment, which is an integrated environmental, health and safety stewardship commitment that encompasses products, operations and employees. This directive comes from our headquarters long before Malaysian government's law and it is much stricter than the law" (Respondent # 16, private sector actor, interviewed on 17 December 2008, verbatim).

One group of important players in e-waste management which the existing e-waste policy has overlooked is the informal e-waste recycling industry. They consist of, first, door-to-door scrap buyers, commonly known as 'old newspaper men' (*orang surat khabar lama)* (as they normally go around the neighbourhood making their presence felt by chanting 'old newspapers' over a

loud-hailer); and, second, the scavengers who collect waste from public dustbins, dumpsites and landfills (see Plates 5.7 and 5.8). Both door-to-door scrap buyers and scavengers play a significant role in household e-waste management in Malaysia. Their activities could, in theory, prevent e-waste from ending up in the solid waste landfills (see Figure 5.1), provided that they act as agents (or middle men) and sell the e-waste to licensed contractors for final processing.

However, through field observations and interviews with door-to-door scrap buyers and scavengers, it is clear that this – the channelling of e-waste from informal collectors to licensed contractors – is not happening. Instead, they are involved in backyard dismantling activity (Respondent # 31, 18 February 2009 and Respondent # 30, 2 February 2009). Backyard dismantling is a process where e-waste is dismantled manually to salvage working parts (and sell them to electrical and electronic repair workshops), and precious materials are recovered by burning or deploying the acid bath technique. The remainder is disposed of together with normal household waste, which ends up in landfill. This activity is not only harmful to the environment but also exposes the scavengers to health hazards. There are three factors that are responsible for the existence of these groups in the waste management stream; firstly, the high demand and value of e-waste (despite it being treated as waste by others); secondly, the lack of proper disposal facilities for consumers; and finally, ineffectiveness of legal framework and enforcement which permits scavenging activities.

The presence of these important actors in waste management who fall outside the normal ambit of management raises questions about whether the Malaysian government can achieve its goal of controlling pollution. Essentially, a significant proportion of e-waste, and especially that from household sources, is channelled through an informal network of unregistered and unregulated scavengers and recyclers. The presence of these actors is common in the

management of normal solid waste in many less economically developed countries, where these actors are considered a nuisance at disposal sites as they could hinder the effective operation of the disposal system. However, according to Hassan et al. (2000), these actors' activities are, in fact, an advantage as they undertake waste separation at no cost. They suggest that a system where these actors are registered with the relevant authority be introduced so that their comparative advantage can be utilized. In relation to e-waste management, this suggestion by Hassan et al. (2000) is a practical way to provide better control of e-waste and to avoid e-waste from ending in landfill. This is only possible if the authorities can provide a mechanism where the e-wastes 'rescued' by these actors (from the landfill or disposal sites) are bought by the licensed contractors at a reasonable price to be processed in an environmentally sound manner. The fact that Malaysian e-waste law was modelled after the laws from more economically developed countries (where problems related to informal networks of scavengers and scrap dealers do not exist to the same extent) may have been the reason why it was not considered by Malaysian law makers.

Plate 5.7: A scavenger rummaging for recyclables, including e-waste in a public dustbin. (Source: author)


Plate 5.8: E-waste is mixed with other scrap in a door-to-door scrap buyer's adapted motorbike. (Source: author)

The second significant weakness of the law is that it provides provisions for actors to get around the law by obtaining written approval from the Director General of Environment. This is prominent in issues related to exclusion from disposing, treating or recovery of material at the prescribed premises, storage of e-waste above permitted limits, and import and export of e-waste, and will be discussed in turn in the following paragraphs. As mentioned earlier, the law specifies (in Regulations 4, 5 and 6) that storage, treatment and disposal of hazardous waste should be undertaken at prescribed premises only. However, a provision for special management of waste is found in Regulation 7 of the law, which enables waste generators to apply for an exemption. According to Regulation 7, waste generators may apply to be exempted from disposing, treating or recovery of material at the prescribed premises by writing to the Director General. An application should be made to the Director General of Environment with documentary evidence that the wastes do not exhibit any dangerous or hazardous characteristics such as corrositivity, ignitability, reactivity and toxicity to human and other life forms and accompanied by a prescribed fee of RM300 (Lee 2006). Another similar example concerns the storage of e-waste. Malaysian law limits the storage of e-waste within certain amounts and durations. Restrictions in terms of specified quantity and duration of storage are given in Regulation 9 of the Environmental Quality (Scheduled Wastes) Regulations 2005 which allows e-waste to be stored for not more than 180 days after being generated, and the quantity should not be more than 20 metric tonnes. An opportunity to get around the law is available by obtaining written approval from the Director General of Environment. An application for a waiver to store more than 20 metric tonnes of hazardous waste should be addressed to the Director General of Environment who will grant a written approval either with or without conditions if he/she is satisfied with the application.

Another related example is regarding the export and import of e-waste. The provision on prohibition and restriction of import and export of e-waste is

spelled out in Section 34B of EQA 1974 (amended 1996) (which should be read with Environmental Quality (Scheduled Wastes) Regulation 2005). This piece of law prohibits the export of e-waste for final disposal, but allows it to be exported for recovery subject to the export guidelines on minimum percentage for recoverables and by obtaining prior written approval from the Director General of the DOE. According to the report of 'E-waste Inventory Project in Malaysia' (2009), 90 metric tonnes of e-waste was exported to Thailand in 2005 and 1,925 metric tonnes was exported to the USA, Germany, Belgium and Thailand in 2006.

Similarly, according to the same section (Section 34B), the import of hazardous waste is discouraged, except import for final disposal from OECD countries which is totally prohibited. However, import of e-waste from non-OECD countries for recovery may be permitted, again subject to obtaining special permission from the Director General of the Environment (http://www.basel.int). In 2006, 4,628 metric tonnes of e-waste was imported from the USA (E-waste Inventory Project in Malaysia Report 2009) and 50,699 metric tonnes was imported from the USA in 2007 (The Interpol Pollution Crime Working Group (Phase II) Report 2009). This approach, where players are offered an opportunity to by-pass the law by obtaining written consent from the Director General, is not helping in strengthening the enforcement of the law, and subsequently is not contributing to effective control of pollution emanating from the process of e-waste disposal. Another limitation in the implementation of Malaysian e-waste law (other than the weaknesses in the content of the law discussed above) relates to the enforcement of the law, to which this chapter will now turn.

***Limitations in Enforcement of the Law***

Issues relating to pollution emanating from e-waste are still unresolved despite the introduction of relevant legislation. Discussions in the previous sub-sections have shown that there are several weaknesses in the promulgated law.

Apart from these flaws in the statutes, the enforcement of the laws is not as efficient or effective as might be desired. The weaknesses of the design of the law have apparently been a cause of concern among enforcement officers. This was revealed by a respondent during an interview who said:

> "Most laws are formulated and decided by the policy makers within the four walls of their offices and they don't bother to look into its practically in term of implementation. The burden after the law was approved is passed to the enforcement officers to deal with" (Respondent # 8, Government, interviewed on 26 November 2008, verbatim).

The limitations faced by the Malaysian government in ensuring effective and efficient enforcement of the existing law and opportunities for improvement is primarily related to human resources: the limited number of personnel (enforcement officers), and the lack of communication (and cooperation) between staff (especially from other government agencies).

Issues related to ineffective enforcement of laws due to the limited number of personnel was raised by all respondents from the DOE in their response to questions as to why problems related to e-waste are still recurring despite the legal provisions that exist. As of 2009, the DOE operated with 1,567 officers and with branches in every state (Department of Environment – www.doe.gov.my), compared to only nine officers in 1977 (Hezri and Hassan 2006). However, the significant increase in the number of staff is not sufficient as the complexity of environmental issues is also on the rise. To a question on what action was taken by the DOE to ensure that Malaysia is not and will not become a dumping ground for e-waste from foreign countries, a respondent representing the DOE said:

> "The ideal way is to place our enforcement officers at every entry point or at least at the main ports in Klang, Penang, Johor. But that is just impossible. Not with the current number of staff that we have. We are short of staff" (Respondent # 1, Government, interviewed on 27 November 2008, verbatim).

Lack of staff has also affected the processing time of applications. A respondent from a private company dealing with import and export of used computers revealed that they were kept waiting for more than three months to get an approval for their application to import used computers, only to be told after numerous follow up calls that the officers in-charge were too busy handling issues on open burning and transboundary haze and had not attended to the application (Respondent # 23, 20 November 2008). This respondent was particularly upset to be told that issues of transboundary haze were given priority over their application as the haze attracted more media coverage and had the potential to tarnish the image of the department and the country. During site visits to several treatment and recovery plants, I observed that two of the prescribed premises contravened the law by not having proper labels on drums containing hazardous waste. More rigorous and frequent visits by the enforcement officers to prescribed premises is needed to monitor compliance of law more efficiently which, of course, depends very much on the number of staff available.

In enforcing the law, the DOE needs the support from other government agencies (from other ministries) such as the police (regarding the visits to prescribed premises) and customs (regarding import and export of e-waste) which is not always available. Effective communication is also lacking. For instance, when the DOE released the guidelines on classification of used electrical and electronic equipment on 15$^{th}$ January 2008, the Customs enforcement officers claimed they were not informed (Respondent # 23, 20 November 2008). According to this guideline, electrical and electronic

equipment which fulfil certain requirements (such as, are manufactured less than three years from date of import, and are intended for direct re-use) are allowed to be imported. Due to miscommunication, a consignment of used computers (which according to the guideline could be legally imported) was required to be returned to the exporting country causing financial loss to the importer (Respondent # 23, 20 November 2008). The limitations of the existing law (both in content and enforcement) may have negative implications that can be a hindrance to effective governance. According to Lau (2004), weak enforcement of law due to inexperienced staff and financial constraints are common in many less economically developed countries.

### 5.2.3 E-waste Law: Implications of Implementation and Improvement Actions

As a result of e-waste import restrictions due to the implementation of the law, many e-waste recycling companies are suffering from insufficient raw materials and are running below capacity. This has happened because there is a lack of data on the amount of e-waste generated locally which has prevented the DOE from making a correct judgement about the number of plants needed in the country (Respondent # 1, 27 November 2008). One plant in particular operates at only 30% of its capacity (Respondent # 25, 19 December 2008). Due to this, a few companies have had to walk away from the business and permanently closed down their operations, while others are taking immediate steps to rectify the situation such as applying for a waiver to import e-waste, relocating to or setting up a branch in a neighbouring country (mainly Singapore), and initiating voluntary recycling campaigns to increase the amount of raw materials from local sources (see Section 6.2.2).

Although there are too many licensed e-waste recovery plants (relative to the amount of locally generated e-waste) (Respondent # 25, 19 December 2008; Respondent # 26, 4 March 2009; Respondent # 22, 1 March 2009), many waste

generators are nonetheless applying for waivers to export their waste to be processed (treatment, recovery, disposal) overseas for the reason that the available technology in the country is not up to standard (Respondent # 16, 17 December 2008). This is a matter of quantity over quality. A representative from an international company in Georgetown narrated during an interview that the company conducted audit trails to the appointed e-waste contractors' premises. From their experience, these contractors were operating with lack of security features and were not conforming to the EQA even though they are licensed contractors. The company failed to find even one premises that could meet the high standards set by their headquarters, and they therefore had no choice but to apply for a waiver to ship their e-waste overseas. According to the representative, who sits on the board of management of the company, the waiver will end in 2012 and the company is considering two options; either to set up their own e-waste treatment and recovery of material facility in Malaysia so as to meet their standards, or to relocate the whole business to another country (Respondent # 16, 17 December 2008).

The situation mentioned above (where many e-waste generators apply to export their e-waste to be processed overseas, despite claims of lack of raw materials by local plants) is a strong indication that Malaysian e-waste law has not been fully successful in controlling pollution from formal e-waste treatment and disposal activities. It is also an indicator that a significant amount of e-waste (especially generated from non-industry sources) is not entering the formal e-waste stream (see Figure 5.2), but instead is channelled through the informal recycling system (which is neglected in the existing law), resulting in the insufficient supply for the licensed e-waste industry. The same situation existed in China after the introduction of policy measures in 2001, where e-waste was sold to informal recyclers (peddlers and small workshops) as they pay a higher price than the registered plants resulting in insufficient e-waste for the large-scale regulated e-waste treatment plants (Zhang 2009). The implementation of the law potentially has tremendous impacts on the economy

as several companies are considering moving their operations to other countries where advanced e-waste processing technology is available, and their business operation is not hampered by national law.

### 5.2.4 State Actor's Effort in Improving Control on E-waste

One of the efforts taken by Malaysia's DOE to improve pollution control due to e-waste disposal has been to draft a law on household generated e-waste. As mentioned in Section 5.2.2, there is no provision on the control of household generated e-waste in the existing law. The formulation of the new law is influenced and shaped by the principle of Extended Producer Responsibility (EPR). The EPR movement began in Europe and its application for e-waste management started in 1998 in Switzerland. It has since undergone evolution and refinement, and has been widely adopted as a means to control e-waste especially across Europe and Asia (Wagner 2009, Khetriwal et al. 2009). Four principal goals of EPR are; to reduce usage of raw materials, to prevent or reduce the amount of waste, to encourage design or redesign of more environmentally compatible products to foster recyclability and reusability, and to facilitate closure of material loops to promote sustainable development (OECD 2001). Among the policies which are based on this principle are the following EU directives: Waste Electrical and Electronic Equipment (WEEE) (Directive 2002/95/EC), and Restriction of the Use of Certain Hazardous Substances (RoHS) (Directive 2002/96/EC), which were introduced in 2003.

WEEE requires producers to be responsible on product labelling to inform consumers of proper disposal of unwanted electrical and electronic items, and to organise and finance take-back, treatment, recycling and recovery of e-waste (Directive 2002/95/EC). Unlike WEEE, which impacts on other countries' policies, RoHS influences the policy measures of private electrical and electronics item manufacturers. This is because electrical and electronic manufacturing is a globalised business, with components sourced from

different countries worldwide, and are shipped to other countries for further processing and assembly. Many of these items would finally enter Europe's market and fall under the jurisdiction of RoHS and WEEE upon disposal. Due to this fact, many international manufacturers apply RoHS to all suppliers globally, making RoHS a de facto global standard for electronics manufacturing (Goosey 2004).

Besides the EU directives, Malaysia's DOE is also learning from recycling and take-back policies of other countries such as Japan and South Korea (Respondents # 1, 27 November 2008). The progress of Malaysian e-waste legislation relative to the Basel Convention, the EU's directives (WEEE and RoHS), and Japanese and South Korean law are summarised in Table 5.2 (also highlighted in Table 5.2 are the areas of concern of each piece of legislation). Japan enacted the Home Appliances Recycling Law in 2001 to control recycling of television sets, refrigerators, washing machines and air conditioners. Under this law, transportation fees are paid by consumers, and discarded appliances are sent to recycling facilities. While in South Korea, new e-waste legislation was enacted in 2003 determining that television sets, refrigerators, washing machines, air conditioners and personal computers must be recycled under the Extended Producer Responsibility (EPR) principle, where manufacturers pay recycling fees to recycling management bodies, and the work of recycling facilities is subsidized by these bodies (Terazono et.al. 2006). However, the experience from other countries as mentioned above, may not be fully applicable in Malaysia, as most household waste generators are expecting payment for their waste (as they are aware of the precious content of e-waste), and are more inclined to value e-waste from the economic perspective rather than environmental perspective.

Table 5.2: Progress of e-waste law in Malaysia in relation to the international development

| Date enacted | Title of legislation | Areas of concern |
|---|---|---|
| 5th May 1992 | Basel Convention | Curbing illegal shipping and trading of e-waste from Organisation for Economic Co-operation and Development (OECD) countries to non-OECD countries. |
| 1996 | Inclusion of Section 34(B) into Environmental Quality Act 1974 | Provision on the control of hazardous waste included to address the international commitment to the Basel Convention. |
| 2001 | Japan introduced Home Appliances Recycling Law | Recycling of television sets, refrigerators, washing machines and air conditioners. |
| 2003 | Korea introduced a similar law | Television sets, refrigerators, washing machines, air conditioners and personal computers must be recycled under the Extended Producers Responsibility (EPR) principle. |
| 2003 | EU introduced WEEE Directive | Overall reduction of e-waste and the adoption of sound disposal methods in member states. |
| 2003 | EU introduced RoHS Directive | Comprehensive management of e-waste by product regulation and |

| Date enacted | Title of legislation | Areas of concern |
|---|---|---|
| | | restriction on certain hazardous chemicals. |
| 2005 | Environmental Quality (Scheduled Wastes) Regulations 2005 | E-waste is prescribed as a type of hazardous waste. |
| 2 January 2007 | UK introduced The Waste Electrical and Electronic Equipment Regulations | Producers are required to set up a take back system so that WEEE can be returned free of charge and collected separately based on Extended Producers Responsibility. |
| Expected on 2010 (first meeting held on 15th October 2008) | Environmental Quality (Recycling and Disposal of End-of-Life Electrical and Electronic Equipment) Regulation 20__ | Prohibiting the use of hazardous substances in electrical and electronic equipment and e-waste take-back system. |

Legend: International/foreign law

Legend: Malaysian law

Learning from and influenced by the experience of foreign countries in adapting the EPR principles in law making, Malaysia's DOE has extended an invitation to stakeholders to be involved in the new law formulation process (Respondent # 1, 27 November 2008). As discussed in Section 6.2.1, representatives from the electronics and electrical equipment manufacturers and importers/distributors (which were divided into four working groups: office utilities, home appliances, mobile phones and computers), e-waste recovery plant operators and representatives from the government met to

discuss the matter on 15th October 2008. The final draft of the law, with a proposed title - Environmental Quality (Recycling and Disposal of End-of-Life Electrical and Electronic Equipment) Regulation 20_ _ - was expected to be completed in 2009 and ready for implementation in 2010. However, the target was not met due to lack of agreement on certain matters among the stakeholders. In China, disputes among stakeholders over key issues such as distribution of responsibilities, has delayed the law formulation process for seven years. The law, called 'Regulation for the Administration of Recovery and Disposal of Wastes 2009' was finally issued on 25 February 2009 (Qiu et al. 2005, in Zhang 2009).

In Malaysia, among the issues raised by the electronic and electrical equipment manufacturers, importers and distributors (which will be directly affected by the implementation of the proposed law) were:

- Logistic and transportation of e-waste especially bulky home appliances such as refrigerators and washing machines
- Protection of confidentially of Intellectual Properties of e-waste
- Responsibility for the costs incurred
- Setting up of e-waste collection centres at places convenient to consumers before being sent to recovery plants
- Proposal to apply Individual Producer Responsibilities
- Revision on the law on import and export of e-waste.

(source: summarised from minutes of meeting between DOE and relevant private sector actors, dated 15th October 2008.)

During the meeting, the Individual Producer Responsibilities principle was proposed by the representatives from the electronic and electrical equipment manufacturers and importers/distributors, as an alternative to EPR. This was because the Malaysian market is flooded by cheap products made by small

companies in China, which are known as 'fly by night' companies. Most of these companies cease operation after producing a batch of equipment and start again with a different brand, making it impossible to track them to make them responsible for their products. In a nutshell, e-waste law in Malaysia has evolved significantly through the years largely influenced by developments at international level. The DOE, as the authority to administer EQA, has been actively updating and improving the existing law. Table 5.2 charts the evolution of e-waste law in Malaysia, in relation to developments at international level and in other countries.

## 5.3 Adopting Persuasion Mode in Governing E-waste

One mode which is being adopted in e-waste governance is the persuasion mode; a mode to govern without sanction. The approach commonly adopted in persuasion mode is the public campaign, where society is guided to achieve certain objectives through sharing of information and providing related facilities. In this matter, the Strategic Communication Unit (a unit under the DOE head office in Putrajaya – see Figure 5.1) has initiated a campaign as an approach to promote end-of-life mobile phone recycling. The programme, called 'Used Hand Phones Recycling Campaign' aims to persuade consumers to dispose of used mobile phones (and related accessories and peripherals) responsibly. This campaign aims to achieve two objectives; the first objective is to increase awareness of the importance of proper disposal of e-waste to avoid hazardous impacts on humans and the environment, and the second objective is to provide disposal facilities to encourage and assist the public in participating in the programme (Respondent # 2, 27 November 2008).

The drop-off disposal method was adopted, and collection bins were located at selected government offices, universities and shops throughout the Malaysian Peninsular (Plates 5.9 and 5.10). As of November 2010, a total of 114 bins had been distributed with 70% of them concentrated in the Klang Valley (the most

modern conurbation in Peninsular Malaysia covering Kuala Lumpur and the state of Selangor). This programme was first launched in October 2002, but faded away and became inactive only a few months after it was launched (Respondent # 2, 27 November 2008) due to several obstacles regarding human resources and financial support. It was reactivated and re-launched in 2004 after receiving a capital injection of RM200,000 (£36,000) from the government. Nevertheless, it was still unable to achieve its collection targets, contributing to the below-expectation performance of this campaign. However, comparison of the performance of this programme (before and after the capital injection) is not possible as records on the amount of collection are not available (Respondent # 2, 27 November 2008), or perhaps were not kept at all.

There are many factors which have contributed to the below-expectation performance of this campaign. Among the most critical factors cited by the DOE officers during interviews was the lack of environmental-consciousness among the public which, of course, was the reason why the campaign was initiated in the first place. However it is clear that the campaign itself suffered from a number of flaws, which contributed to its underperformance such as: lack of staff (to monitor and maintain the programme), frequent changes in the staff-in-charge, lack of financial means (to pay for advertising and campaign materials), poorly located bins and poor mechanisms for disposing of collected items.

Lack of staff has hindered this programme from being expanded. There are only two officers in-charge of the programme. Among the scope of the job regarding the recycling programme is to monitor and empty the bins as and when needed, which is in addition to their office-bound responsibilities as enforcement officers. These officers are also in-charge of other programmes related to increasing awareness and knowledge of environmental preservation and conservation. Both officers are not only too busy with paperwork, but also

none too happy to do the job of monitoring and emptying the bins. During the interview session, one of them said:

> "Can you imagine…both of us have to go round and clear the bins of any rubbish such as sweet wrappers, bulbs, dry cells which are not supposed to be in the bin, when there are mountains of files on our desks waiting to be attended. Imagine the 'disaster' it would bring if any of our family members or friends happened to be there at that time and see what we were doing. They must have thought that I have been lying about having a degree…" (Respondent # 2, Government, interviewed on 27 November 2008, translated from Malay language).

Lack of financial support has had huge implications for the programme especially related to publicity. For example, due to the limited budget allocation, the DOE is not able to pay for slots in television commercials (Respondent # 2, 27 November 2008), which is more effective but more expensive than the printed media in increasing the level of awareness among the public. Instead, several other methods to increase public awareness were adopted such as advertising in a local newspaper on the danger of improper disposal of e-waste, renting a booth at a popular fair called "*Carnival Sure Heboh*" to share information on proper e-waste disposal, disseminating information through the DOE's website (www.doe.gov.my) and the distribution of pamphlets and car stickers (Respondent # 2, 27 November 2008). Lau (2004) in research on solid waste management found that Malaysian waste reduction efforts through recycling campaign are ineffective due to three reasons; lack of information to the public or lack of publicity, financial constraints and lack of specific targets. As found by Davies (2008) in her research on waste management in New Zealand, publicity and concerted effort from state actors at various levels are crucial in the persuasion mode of governance (see Section 3.4.3). In the case of the Malaysian government's

persuasion mode of governance on e-waste management it can be concluded that both these elements of a successful campaign have been missing.

In 2006, the DOE started inviting non-state actors to work collaboratively in this campaign in order to extend its scope (in terms of publicity and the distribution of bins). Five private companies responded to this call. After negotiations, the DOE decided to work with a shopping centre which agreed to allocate space for the collection bins (Plate 5.9). Besides collection, this company was also involved in sending messages on environmental awareness (including proper e-waste handling and disposal) to its customers through an annual programme called "Eco Show Case" (Respondent # 20, 21 January 2009).

Another significant obstacle faced by the DOE in this programme was related to the disposal of the collected e-waste. Under Malaysian e-waste law (Environmental Quality (Scheduled Wastes) Regulations 2005), the rights to transport, store and dispose of e-waste are only given to contractors which are licensed by the DOE. The Strategic Communication Unit of the DOE has neither the license to transport and store the collected e-waste nor the expertise and facilities to dispose of it. To resolve the matter, a collaborative arrangement with a private e-waste contractor was established. Under the arrangement (which was started in December 2009), the licensed e-waste contractor took over the process of emptying the collection bins, and transporting, storing and disposing of the used mobile phones collected under this programme. All the costs incurred by the company in carrying out the processes are met by the sale of precious materials recovered from the e-waste. Although elements of collaboration are apparent in this case, all the parties involved (the DOE, the shopping centre and the e-waste contractor) refused to label it as a partnership. According to the state actor, non-state actors in this programme are not considered as partners (where resources and power are shared) but merely as allies to help them solve shortcomings regarding

placement of bins and collection and disposal of waste (Respondent # 2, 27 November 2008).


Plate 5.9: The handphone recycling bin in a shopping centre. Note the amount of dry cells which were disposed in the bin due to low level of awareness about recyclable items among the public. (Source: author).


Plate 5.10: The handphone recycling bin in the DOE headquarters Putrajaya. (Source: www.doe.gov.my)

According to Hassan et al. (2000) based on their research in Malaysia, persuasion actions in waste management require continuous effort from state and non-sate actors; and should stress not only the importance of waste recycling, but also the protection and conservation of environment as a whole. This is in agreement with Davies (2008), who claims that persuasion (especially through campaigns) should be done continuously (and not as a one-off event) to increase its long term effectiveness (see Section 3.4.3).

## 5.4 Conclusion

In this chapter, the various roles of state actors were analysed through the lens of the multiple modes of governance in which they are involved. State actors' roles in the hierarchical mode of governance – mainly to formulate relevant

law and its implementation - were not very effective due to several flaws, both in the statutes themselves and in their implementation. The existing legal framework, which adopts a licensing system to control pollution from e-waste during the treatment and disposal process (including the processes of dismantling, material recovery, treatment and final disposal), and consignment notes to track e-waste generators (which is limited to industrial e-waste generators) and the movement of e-waste may have a positive short term effect but did not address the root of the problem. This is because the law overlooks another source of e-waste production which is the householders (and other non-industrial source. Besides that the law neglects an important player in e-waste recycling chain which is the informal recyclers. Apart from the loopholes in the content of law, weak enforcement has also contributed to its lack of effectiveness. For example, as in the example recounted in Section 5.2.3, pollution can still occur at licensed premises due to lack of effective monitoring.

To overcome the weaknesses in e-waste control which are related to the implementation of the existing law (Environmental Quality (Scheduled Wastes) Regulation 2005], the government of Malaysia is now in the process of drafting a new law, which will focus on solving the issue regarding collection of e-waste from non-industry sources. One big step ahead, in terms of increasing the participation of non-state actors in governance has been taken by the Malaysian DOE, by inviting stakeholders from the private sectors to be a part of the law drafting process. The involvement of PSAs in the drafting of this law is seen by many critics as a way to transfer the responsibility of managing the collection and disposal of e-waste to the manufacturers rather than a democratic process to increase public participation in decision making (Respondent # 48, 21 November 2008; Respondent 49, 13 November 2008). Many non-state actors are also sceptical about the ability of the DOE to implement the new law, judged on the basis of their weak performance in administering the existing law.

The role of state actors is not restricted in the traditional hierarchical mode of governing, but is expanding to include persuasion mode as well. This is evident in the 'Hand Phone Recycling Campaign' which is initiated by and organized under the purview of the DOE. Although the state actors' efforts to adopt persuasion mode in governing e-waste is commendable, the results have not been very encouraging. The government's campaign is limited in term of geographic coverage and publicity due to three reasons: first, lack of staff to manage the programme; second, lack of financial resources for wider, louder and more visible publicity; and third, lack of ability to treat and dispose the collected e-waste.

Based on the case studies brought forth in this chapter, several reasons have been identified as the factor for the state's incapability to undertake their roles in e-waste governance more effectively. Amid the many reasons, one similar reason can be discerned, that is human resource. The problems related of human resource have repeatedly surfaced during interview sessions with the state actors' representatives, both during the discussions on their roles in the hierarchical mode and persuasion mode of governance. The problems of lack of staffs and weak communication among staffs are said to be affecting the roles of state actors in implementing the law and maintaining public campaign. This indicates that the ineffectiveness of state actors' intervention in e-waste governance in Malaysia is caused by the handicap of the actors and is not the fault of the mode. State actor's incapability in governing e-waste has been a trigger factor for the intervention of non-state actors in environmental governance in Malaysia, particularly in managing the collection and disposal of e-waste from household source. However, do non-state actors possess the necessary ability and capability to govern e-waste without the state actors? This is the issue where this thesis now turns.

# Chapter 6: The Roles of Non-State Actors in E-waste Governance

## 6.1 Introduction

The efforts of state actors in managing e-waste in Malaysia have so far shown limited success as indiscriminate dumping and improper-disposal of e-waste is still prevalent in Malaysia. The 'failure' of governance led by state actors has opened up opportunities for non-state actors to be involved in governance. Moreover, the emergence and proliferation of third sector actors in decision making processes in the Global North, especially regarding environmental issues since the 1990s, has inspired like-minded organizations in Malaysia to become involved in the governance process. Not only has this been seen as a way to resolve environmental issues but also a way in which to introduce a more democratic procedures, such as including public participation in the decision making process.

In addition, the emerging dominance of neoliberalism in the 1980s has resulted in an increasing number of joint decisions between PSAs and state actors (Kooiman 2003). Several scholars (see Trumpy 2008, and Seidman 2007) suggest that the expansion of neoliberalism has resulted in states becoming less able to control and regulate corporate activities, hence increasing the power of PSAs in decision making process. The combination of these factors has resulted in significant involvement of non-state actors in the e-waste governance process globally and the introduction of more innovative and flexible governing tools besides the traditional command and control method. The purpose of this chapter is to examine the extent of such purportedly global trends are also visible in the less economically developed countries in the Global South, where the state has traditionally retained a strong 'command and control' position.

Within the literature on governance, intervention by non-state actors is normally associated with non-hierarchical modes involving persuasion, self-governance and co-governance. However, as the long standing literatures on policy making suggest, it has been observed that non-state actors can also play significant roles in hierarchical modes of governance. Although non-state actors are not involved directly in enacting policy, they may significantly influence state actors in decision making, the formulation of law, and on occasion, its implementation. Such processes are commonly observed in the Global North, however it is relatively rare in a less economically developed nation such as Malaysia (where public participation is still limited), and moves in such direction would constitute something of a revolution in governance practice. Taken together, the increasing role of non-state actors in shaping the hierarchical mode of governance together with their involvement in non-hierarchical modes, have raised an important question: are non-state actors able to compensate for the weaknesses of the state and effectively fill the governance gap surrounding e-waste?

This chapter begins with looking at the problems relating to the division of actors in e-waste governance in Malaysia in Section 6.2. The division between state and non-state actors may appear simple in theory, but is complicated in practical as the shadows of government on the non-state actors are very prominent. This is followed by discussions on the diverse roles of non-state actors in Malaysia, based on their involvement in the hierarchical, persuasion of self-governance modes of governance. The roles of non-state actors in co-governance modes (particularly in PPP) are discussed in Chapter 7. Although there is evidence from the research undertaken regarding the involvement of non-state actors in other types of co-governance (such as networking among non-state actors), some are overlapping with other modes (such as persuasion) and therefore are discussed in this chapter under the headings of other modes. The chapter proceeds by discussing the roles of PSAs in hierarchical, persuasion and self-governance modes in Section 6.3, and the roles of CSOs in

the mentioned modes in Section 6.4, before drawing some comparisons between these actors in the conclusions (Section 6.5).

## 6.2 The Shadows of Government on Non-state Actors in E-waste Governance in Malaysia

The term 'non-state actor' has no standard definition (Schwartz 2004), and in this thesis the term 'non-state actors' is used to refer to any actor in the governance process who is independent from the state and is legally registered. In Malaysia, all non-governmental profit-making organizations are registered with the Companies Commission of Malaysia (CCM), and non-profit organizations are registered with the Registrar of Societies (ROS). The term private sector actor (PSA) is used to refer to non-governmental profit-making organizations in this thesis, and civil society organization (CSO) is used to refer to the non-governmental non-profit organisations, as illustrated in Figure 4.3. In this research, private sector actors were divided according to their main activities related to e-waste, namely manufacturing, sales, services, recycling, telecommunication service provider, collection and disposal of waste.

CSOs, which are defined by the World Bank as 'the wide array of non-governmental and not-for-profit organizations that have a presence in public life, expressing the interests and values of their members or others, based on ethical, cultural, political, scientific, religious or philanthropic considerations' (World Bank website, available at www.worldbank.org), consist of many categories of organizations. Therefore, based on this definition, any organization coming under the following categories is considered as a civil society organization: community groups or community-based organizations (CBOs), non-governmental organizations (NGOs), labour unions, indigenous groups, charitable organizations, faith-based organizations, professional associations, and foundations (World Bank website, available at

www.worldbank.org). In this research, only two types of CSO - CBOs and NGOs - are taken into consideration (see Figure 4.3).

The significant difference between CBOs and NGOs lies in their scope of interests, staffing, funding and limits of operating area. CBOs are set up by a group of people in a neighbourhood to protect common interests such as to achieve greater unity among residents or to provide security to a neighbourhood. CBOs are operated by volunteers who are residents of the area. The two most common CBOs in Malaysia are the neighbourhood group *(Rukun Tetangga* (RT)) and residents' associations (RA) (see Figure 4.3). A significant difference between RAs and RTs relates to their memberships. While all residents of an area are automatically considered as members of their RT, residents are required to pay registration and yearly fees to become a member of an RA. Despite these differences, RTs and RAs share similar objective of establishment.

Determining the boundary of an NGO and non-NGO can be confusing especially in cases where NGOs such as research organizations are sponsored entirely by profit-oriented organisations or financed totally by the government. Another tricky issue concerns GONGOs (government organized NGOs) (sometimes also known as QUANGOs – Quasi-autonomous non-governmental organizations). In China, GONGOs are established for three main reasons; first, to reallocate government's financial budget in departments which are involved in cutting down of budgets; second, the flexibility of GONGO compared to bureaucratic institutions; and third, to attract foreign financial resources (Wu 2002, Wang and Sun 2001). Additionally, based on the work by Martens (2006), political background and the dominant role of the state are also factors influencing the establishment of GONGOs in China. In other parts of the world (such as in Malaysia, as this thesis presents in Chapter 7), it is becoming more common that GONGOs are involved in environmental issues.

Classifying actors of governance into state and non-state is not always straight forward. There are three examples related to waste management in Malaysia where classification of organizations into categories becomes quite blurry. The first example is regarding two profit-making companies - Alam Flora Sdn. Bhd (which is involved in solid waste management and is awarded a twenty years concession to manage waste in central and eastern area of Peninsular Malaysia) and Kualiti Alam Sdn Bhd (the only company managing hazardous waste disposal in Peninsular Malaysia) - which are very closely related to the ruling government. Kualiti Alam is a subsidiary company of UEM Group, and Alam Flora is a subsidiary company of DRB HICOM. Both UEM Group and DRB HICOM are Government-linked companies (GLCs) which are owned by Khazanah Nasional Berhad (www.khazanah.com.my). Khazanah Nasional Berhad (literally translated as National Treasury), is the investment holding arm of the Government of Malaysia and is empowered as the government's strategic investor in new industries and markets (www.khazanah.com.my). It is clear that these two companies are linked to the government, but yet they are still considered as a private company in Malaysia.

The second example is in the case of a research institution called SERI (The Socio-Economic & Environmental Research Institute) in the state of Penang. SERI is established as an independent non-profit company with the primary objective is to help the Penang state to achieve a sustainable level of balanced development in the long term (www.seri.com.my). SERI claims itself as an NGO; however according to the classification used in this thesis, SERI does not possess the criteria to be an NGO based on two reasons. First, two representatives from the state government (two Deputy Chief Ministers) sit in the Board of Directors of SERI (www.seri.com.my), and second, all its financial needs are fulfilled by the state government. Due to these reasons, SERI is considered a GONGO in this research. SERI collaborates closely with the Penang state government, local government-linked agencies and several international organizations including UNDP (United Nations Development

Programme) in providing in-depth economic analysis, and also acts as a platform for disseminating information and facilitating community-centred projects (www.seri.com.my).

The third example is related to an organization which is actively involved in waste management matters in Penang is PEWOG (Penang Environment Working Group). PEWOG is set up by the State Local Government Committee in 2000 to serve as a consultative and cooperative tripartite (Local Agenda 21 - LA21) forum for community, government and private sector to work together on environmental matters (http://pewog.org). It receives a monthly allowance of RM200 (£40) per month from the state government for operating cost, and is headed by a chairman who works voluntarily (Respondent # 55, NGO, interviewed on 18 December 2008). PEWOG has a very close relation to SERI. SERI is responsible to run the day-to-day business for PEWOG as PEWOG has neither paid staff nor an office (Respondent # 55, NGO, interviewed on 18 December 2008). As PEWOG is not a registered organization, it is undoubtedly not an NGO; it is just an extension of the government in an informal form. As a forum with members spreading from the private, public and community, PEWOG is in a way a partnership. However, in an interview, a respondent representing PEWOG strongly hold on to his view that PEWOG is an NGO. As a tripartite forum, PEWOG has a very close cooperation with the CBOs (the RTs and RAs). Moreover PEWOG's chairman is also the chairman of RT of Penang. The sentiment of the chairman disclosed in an interview shows that PEWOG's inclination is less towards the government. This could also be affected by the fact that the current chairman of PEWOG is a prominent member of the ex-ruling party of the state of Penang (The National Coalition or *[Barisan Nasional]*). After the general election on 8th March 2008, Penang state is ruled by the Pakatan Rakyat Coalition. Based on the discussion above, PEWOG and SERI should be categorized in a separate group – GONGO (Government organised NGO) or QUANGO (Quasi NGO). Cases brought above are examples on how shadows

of government and politics affect the classification of the non-state actors in the issue regarding waste management, which would eventually affect the management of waste in Malaysia.

### 6.3 The Roles of PSAs in E-waste Governance

PSAs in this research are classified into seven different groups based on their roles in e-waste governance. The types of PSAs and how they role is prominent in this study is summarized in Table 6.1 below.

Table 6.1: Types of PSAs and their roles in e-waste governance

| **Type of PSA** | **Role in e-waste governance** |
|---|---|
| Electrical and electronic equipment manufacturer | • Generate e-waste in its business operation<br>• Producer of electrical and electronic item which will turn into e-waste |
| Electronic and electrical products retailer | • Distributor of electrical and electronic item which will turn into e-waste |
| Telecommunication service provider | • Rapid advancement of services offered will increase the sale of new item, and thus increasing the end-of-life products |
| E-waste contractor/ Material Recovery Facilities (MRF) | • Provides collection, treatment and disposal of e-waste |
| Solid waste contractor | • Provides collection and disposal of household waste. Certain amount of e-waste may be disposal of together with household waste |
| Scrap dealer and scavenger | • Buy and sell e-waste in the informal |

| Type of PSA | Role in e-waste governance |
|---|---|
| | sector<br>• Involve in cannibalizing of e-waste for spare parts and to recover precious metal |
| Electronic and electrical items repair shop | • Prolong the life of electrical and electronic item<br>• Involve in cannibalizing of e-waste for spare parts and to recover precious metal |

The multiple roles of PSAs in e-waste governance in Malaysia appear to be developing in two prominent directions: firstly, in influencing and shaping policy making; and secondly in promoting proper disposal of e-waste through transformation of societal views and behaviour, and providing related facilities. These are discussed in greater detail below, beginning with their role in shaping policy making in hierarchical mode of governance (in Section 6.2.1), followed by their roles in promoting proper disposal of e-waste through persuasion (in Section 6.2.2) and self-governance (in Section 6.2.3).

### 6.3.1 The Involvement of PSAs in Hierarchical Mode of Governance

The roles of PSAs in e-waste governance are intricately linked to the modes of governance that it is involved. In this section, two examples of PSAs' involvement in hierarchical mode of governance is discussed; firstly, their role is influencing the formulation of state policy and secondly, the effect of supra-national law on national level PSAs.

PSAs, as one of the prominent stakeholders in e-waste governance in Malaysia, have received special attention under e-waste law (for example, in the Environmental Quality [Scheduled Wastes] Regulation 2005). Two categories

of PSAs which are specifically mentioned and governed under the law are industrial e-waste generators and e-waste contractors (who are involved in buying, transporting and dismantling of e-waste for recovery of precious materials and recycling). It is commonly accepted that state actors are the major players in hierarchical mode of governance. As far as e-waste law in Malaysia is concerned, PSAs have no direct role in the formulation of existing law (Respondent # 1, 27 November 2008). However, there is evidence that the influence of PSAs is becoming more apparent in the process of drafting and formulating new pieces of legislation on e-waste control.

One case in point concerns the development of 'producer responsibility' within the Malaysian e-waste policy framework. As mentioned in Chapter 5, the existing law on e-waste is not comprehensive as it does not have any provision to control and manage e-waste generated by households. Extended Producer Responsibility (EPR) or 'take-back' policy is seen as potentially able to provide an appropriate foundation for the formulation of new legislation to overcome the weakness of the existing law. The decision by the Malaysian government to formulate a law which is based on EPR principle was partially inspired by the proliferation of such an approach in many countries in the Global North (Respondent # 1, 27 November 2008). EPR is a policy principle that extends the responsibilities of the manufacturers of the product beyond the post consumer stage. Manufacturers are deemed responsible throughout the entire lifecycle of the product, hence shifting the end-of-life responsibility away from municipalities and consumers and onto the original producers (Walls 2006, OECD 2006, Widmer et al. 2005, OECD 2001, Lindhqvist 2000).

Preliminary work on law formulation began with a meeting between the state actors and relevant PSAs (refer Section 5.2.4). Fifty-five people attended the first meeting which was conducted on 15 October 2008, with the following breakdown; three representatives from the DOE, thirty-eight representatives from the electrical and electronics industry (including manufacturers, sales and

services providers, importers and retailers), and fourteen representatives from the e-waste recovery industry (source: minutes of meeting between DOE and relevant private sector actors on draft formulation dated 15 October 2008). The draft (with the proposed title: Environmental Quality [Recycling and Disposal of Electrical and Electronic Equipment] Regulation 20__) was targeted to be ready by 2009 (Respondent # 1, 27 November 2008). However, the target was not met due to lack of agreement between the PSAs and DOE (Respondent # 10, 12 November 2008; Respondent # 15, 19 January 2009) on certain matters. Among the matters which have hampered the process are concerns over the costs of setting up and maintaining e-waste collection centres, logistics and transportation of e-waste (from collection centres to recovery plants) and the security and confidentiality of data and intellectual properties. During this process, large manufacturers proposed Individual Producer Responsibility (where individual producers are responsible for the disposal of their own brands only) instead of EPR to avoid taking responsibility for the disposal of products by 'fly-by-night' companies (a nickname given to small companies which assembled sub-standard parts to produce cheap products, normally ceasing operation after one batch of production) (see Section 5.2.3). The products are also known as 'orphan' equipment.

These two issues (operating and maintaining costs and managing the 'orphan' equipment) continue to cause disagreement between state actors and PSAs. A respondent representing an international manufacturing company shared his opinion regarding this matter, and voiced his dissatisfaction and worries regarding how this matter is handled by the government;

> "DOE wants to us to bear the cost [of e-waste management], including those which are not produced by us. This is unfair". (Respondent # 16, PSA, interviewed on 17 December 2008, emphasis added).

Another respondent (representing an electrical and electronic manufacturer headquartered in USA) voiced an almost similar concern during an interview session.

> "I've attended the first meeting, and I'm not going to attend any more meetings of this kind in the future. I think DOE just want to use us…I don't believe this [the idea to control household e-waste by law adopting EPR principle] will go far. I don't think DOE will listen to what we say. They just want private companies to pay for the expenses [the cost of collecting and treating e-waste in an environmentally sound manner]." (Respondent # 15, PSA, interviewed on 19 January 2009, emphasis added).

These opinions signify that several PSAs are not willing to take the responsibility for an environmentally sound disposal of the electrical products, due to the 'orphan' products which are flooding the Malaysian market due to its cheaper price. PSAs, especially the MNCs (Multi National Companies) feel that they are the 'victim' where they are asked to be responsible in managing e-waste which is not produced by them. Another respondent (representing an electrical and electronic manufacturer headquartered in Japan) also voiced concerns about the ability of state actors to enforce the law (based on the poor enforcement of the existing law on industrial e-waste);

> "I think Malaysian DOE is too ambitious. EPR as in the West will not work here. At least not now, not even in the near future…" (Respondent # 12, PSA, interviewed on 22 January 2009, verbatim).

Among the concerns voiced by the above respondent are the differences in the socio-economic landscape between Malaysia and the countries in the Global North, from which examples and experiences are being studied, and most probably adopted. In many prominent cases of the application of EPR to

control e-waste such as in Switzerland (Khetriwal et al. 2009), Canada (Deathe et al. 2008), Maine, USA (Wagner 2009) and UK (Mohan et al. 2008), e-wastes are collected from users or returned to producers for free, whereas in Malaysia householders expect payment for returning their e-waste for proper disposal process. A study by Kalana (2010) in Shah Alam, Malaysia, found that people are expecting payment for their e-waste because they are aware that it contains some valuable elements. Similar results were also found by Huisman et al. (2003) in China. The is due to the perspective of waste in the less economically developed countries; where waste is attached to economic values, and recycling is a source of income for some groups of the population (Visvanathan and Norbu 2006). In South Asia, waste is not only a source of income to scavengers, but it also provides an extra income for solid waste management staff (Visvanathan and Norbu 2006).

Several disputes between state actors and PSAs as mentioned above have delayed the promulgation of the law (Environmental Quality [Recycling and Disposal of Electrical and Electronic Equipment] Regulation 20__), hence prolonging the potential of e-waste pollution to the environment. In an interview, a representative from DOE, Malaysia admits that the delay in introducing the law was due to requests by the PSAs.

> "We want it [voluntary e-waste recycling] to be changed to mandatory take-back so that the producers are responsible for their products. We want to get the law approved as soon as possible, but the manufacturers are asking for more time to get ready. They want the enforcement of this policy to be postponed." (Respondent # 1, Government, interviewed on 27 November 2008, emphasis added).

This fact that the state is taking PSAs' discontents into consideration indicates that PSAs are considered as important stakeholder in policy making. It is clear that PSAs are playing an influential role in shaping and formulating the new

law. The decision to 'listen' to the PSAs in this case could also be related to the economic downturn which has been affecting many industries worldwide, including electrical and electronic industries in Malaysia with several factories being closed down. Factories closed down have made headlines in newspapers; at least there were four reports of such in two months period (January and February 2009). Newspaper headlines such as 'Intel to close two Penang plants but no layoffs' (The Star, 23 January 2009), 'Panasonic to close Malacca plant, relocate Selangor factory' (The New Straits Times, 31 January 2009), 'When chips are down, VSS may be best option' (The New Straits Times, 9 February 2009), and 'More layoffs at Penang tech giants?' (The New Straits Times, 24 February 2009) might have influenced the government to halt their plan to 'keep' the investors in the country. The inclusion of non-state actors in policy making in this case is not merely an option to increase public participation in governance process as might normally been expected (hence increasing democracy in decision making) but as a way of transferring the burden of waste management to PSAs. In the opinion of many PSAs, the opportunity given by state actors for them to get involved in policy making came with a cost, where the government is expecting that they bear all the financial burden of the policy in return. This finding signifies that waste governance decisions in Malaysia are significantly influenced by economic factor. As electrical and electronic manufacturing is one of the biggest economic contributors to the country, PSAs have the winning edge in e-waste policy making.

Another example of an important role of PSAs in Malaysia, particularly the branches of MNCs with the headquarters are located in the Global North, is in implementing the 'top-down' company policies. One respondent from an electrical and electronic manufacturing plant mentioned in an interview that managing the expectation of the company's headquarters in Japan regarding waste reduction policy is the greatest challenge for the company. He said;

> "Our HQ in Japan ordered us to reduce the production of waste by 10% from 2004 level by 2010. This is not fair! Because in 2004, we produced CRT TV, which is heavy. Now we have stopped the production of CRT TV and turn to LCD, which is lighter. It would be difficult for us to reach this target". (Respondent # 10, PSA, interviewed on 12 November 2008, verbatim).

On the other hand, there are several evidence on the influence of supra-national laws on the 'top-down' intra-firm management of e-waste in several companies. For example, one electrical and electronic manufacturing plant which produces television for the Asia region's market has to comply with RoHS directive due to the order by the headquarters in Japan. Another company, which produces parts for audio visual equipment, is also complying with RoHS, although it is not the policy of the company. This company is forced to comply with RoHS at the request of their customer, as all its customers are assemblers of electrical and electronic equipment which export their product to the EU. The policies and actions taken by the PSAs as mentioned above are intertwined with the global trend of e-waste governance; where manufacturers are obliged to be more environmentally responsible of their products under EU's law, and the pressure from NGOs. This indicates two important points: first, e-waste governance transcends the political boundary, and PSAs are significant actors of the global e-waste governance because of their global presence; and second, e-waste governance involves the intricate interactions of government, PSAs and NGOs. The roles of PSAs in governance are also significant from the perspective of persuasion mode, to which the discussion now turns.

### 6.3.2 The Roles of PSAs in the Persuasion Mode of Governance

Bell et al. (2010), and Bell and Hindmoor (2009) define persuasion as a mode of governance where actors seek to change both the behaviour of members of the society, and mindset of the members regarding how they ought to behave in order to achieve specific policy objectives (see Section 3.2.2). There are many means through which persuasion is pursued as a mode of governance, and one most commonly used is the public education campaign (Bell et al. 2010). Bell et al. (2010) specify two characteristics of campaign, as a mechanism of persuasion mode of governance; firstly, the activity must be collectively valued by the members of the society and secondly, it must be of immediate interest to the members of the society. They further elaborate, advertisers' efforts to sell products are not considered as exercises in governance through persuasion as they do not fulfill these two characteristics.

By adopting the persuasion mode, PSAs seek to raise awareness and to steer society towards safe disposal of e-waste, though without sanction or punishment. The PSAs role is to inform the public about the hazardous nature of e-waste, thus convincing them to adopt proper e-waste disposal methods. The public education campaigns on safe disposal of e-waste were targeted at the general public, who are consumers of electrical and electronic devices. Several evidence from this research show that the decision of PSAs to apply persuasion mode of governance is driven by the economic value of e-waste, and not environmental concerns. Four examples of the involvement of PSAs from different type of business industries, and targeting different groups in the society are discussed in the next paragraph.

The first example is a campaign by a PSA to educate school children. One private e-waste recycling contractor in Penang sponsors recycling programmes in several schools in Penang, and conducts occasional talks on the danger of improper handling of e-waste. In these talks, school children were also

informed about proper e-waste disposal methods, and organized school visits to their plants to increase understanding of the recycling process. By doing this, the company involved hoped that the children would bring home the message on e-waste recycling to their parents and other family members, producing some kind of ripple effect in increasing the level of awareness (Respondent # 22, 1 March 2009). The Deputy Managing Director who was interviewed admits that the real motive behind the campaign is to increase the raw material for their business operation.

> "Of course we aim for profit for the company. We don't work for charity for the sake of environment only. At the end of the day, *status quo* stays you see…" (Respondent # 22, PSA, interviewed on 1 March 2009, verbatim).

Another private sector actor involved in persuasion is a leading departmental store in Kuala Lumpur with branches in several big cities in the country, which sends messages on proper e-waste handling and disposal to its customer through an annual programme called "Eco Show Case" (Respondent # 20, 21 January 2009). As the age of the customers is wide ranging, several different approaches were adopted such as story telling sessions and colouring contests related to the dangers of improper disposal of e-waste to attract younger children, inviting pop idols to give talks on e-waste issues to attract teenagers, and putting up e-waste related posters and organizing exhibitions to attract a wider spectrum of society. The company also provides e-waste collection facilities for mobile phones and computers. According to the representative of this company, the campaign which is conducted as a part of their CSR (Corporate Social Responsibility) programme, is also one of the marketing strategy to attract more customers (Respondent # 20, 21 January 2009). As in first example, this case proves that public education campaign by PSAs is meant to bring economic profit for the company.

The persuasion mode of governance adopted by PSAs in the third case, involves smaller target groups. Two Japanese international electrical and electronic manufacturers chose to educate the retailers (who are the distributors of their products) on e-waste related awareness and legislation (including the EU's directives such as the WEEE and RoHS) through repeated seminars and conventions; the intention is that these dealers are then in a position to pass on their newly gained knowledge to their customers who are the end users of the devices, and so to persuade them to change their mindsets and behaviour regarding e-waste disposal (Respondent # 11, 19 January 2009; Respondent # 18, 21 January 2009). According to the representative of one of the companies, the campaign was conducted purely for environmental conservation; while the representative from the other company agrees to the suggestion that the campaign is a way to strengthen their brand name as responsible producers, and hence attracting buyers and bring profit to the company. Recycling and recovery of materials from e-waste is financially significant to manufacturers, as recycled materials cost less than virgin materials (Visvanathan and Norbu 2006), hence explaining the importance of public engagement to increase the volume of e-waste.

The three cases above seek to send the same message – the importance of proper disposal of e-waste to avoid environmental and health hazard – to three different target groups in society, hence the different approaches adopted. The fourth case, which will be explained shortly, is slightly different where the actor involved uses cash incentive to stimulate the campaign. According to Enviros (2003, cited in Darby and Obara 2005), incentive is an important motivation if the recycling process is not convenient and/or the waste has high economic value.

The 'campaign plus incentive' programme is conducted by a company based in Seremban, Malaysia, which is involved in recycling and producing CRT (Cathode Ray Tubes) monitors. This company (a joint-venture company of

Korean and American manufacturers) is a DOE-licensed e-waste contractor. The company launched a two-month campaign (from 28th March to 31st May 2007) to collect Cathode Ray Tubes (CRTs) from TV and PC monitors in the town of Seremban. The programme was called 'Local CRT Collection Campaign'. A buy-back method was adopted in this campaign, where participants bring their e-waste to company and be paid based on the weight of the items. The campaign set an ambitious target to collect 10 000 units of CRT monitors, but only managed to get 740 units of CRT monitors (or 7.4%); which involved total payment amounting to RM 7308 (£ 1460) or approximately RM 9.88 (£ 2) per unit of CRT monitor (Respondent # 15, interviewed on 19 January 2009). Among the obstacles noted by the company which have hindered the campaign from reaching the target are logistic and transportation problems and low level of environment awareness amongst the public. According to the company's representative, other than expecting payment, the public expects e-waste to be collected from their home as that is more convenient to them. This agrees with the suggestions in many studies on recycling (see Nixon and Saphores 2009, Riley 2007, Barr 2004) that convenience is an important factor in determining the recycling behaviour.

In an attempt to improve the campaign, the company launched another campaign in November 2008. The campaign called the 'CRT Recycling Campaign' adopted the same mechanism (buy-back), but extended this to include the involvement of two other PSAs – AB and YZ – both are solid waste concessionaires, and operate and manage several buy-back and recycling centres across the nation. By working with AB and YZ, the company expects to be able to overcome the shortcomings of the first campaign as participants have a wider choice of recycling centres to which to send their e-waste, and it will engage a broader population (although it is still geographically limited to the southern and central parts of Peninsular Malaysia). The outcome of this programme is too soon to be assessed during the data collection field trip, as the programme was started in November 2008, and interviews with one of the

PSAs was conducted in November 2008 and the with the other two in January 2009. In this arrangement, AB and YZ act as intermediate agents (to collect and temporary store the CRTs), connecting the society and the e-waste contractor.

Compared to the first campaign, the 'CRT Recycling Campaign' has an increased level of publicity. This includes an interview slot on a radio broadcasting programme, radio advertisement and newspaper advertisement. In the newspaper advertisement, the logo of Seremban Municipal Council *(Majlis Perbandaran Seremban)* appeared next to the logos of the three companies involved, suggesting the involvement of the state actor in this programme. However, when the Seremban Municipal Council was contacted, one officer denied their involvement in this programme. Clarification was then sought from the company which initiates the programme, who admitted that the Seremban Municipal Council is not involved and that the reason the logo was printed in the advertisement is to obtain the trust from the reader and to encourage them to participate and to emphasise that the programme is not a profit-oriented activity. This signifies that the role of state actors is so profound in Malaysia that their presence is required as a means of gaining trust, even in a campaign which is conducted solely by PSAs. Trust is an important factor in determining the decision of the public to recycle, and the public is said to respond better to recycling campaign if they trust the information and the actors involved (Davies et al. 2005).

According to the representative from the company, two factors initiating and motivating the campaign are; first, to increase raw material for their business operation (which is the CRT) and second, to cut the cost of business operation. This programme is an option for the company to source more material for its recycling plant as it is now facing problems sourcing sufficient raw material due to the restrictions on the imports of e-waste following the introduction of

Environmental Quality (Hazardous Wastes) Regulations 2005 (as discussed in Section 5.2.3), while the use of virgin material is too expensive.

> "We need to use the cullet [used CRT glass] in our production to reduce the cost. The cost of using raw material is much expensive, and our business is going down every year…this is because of the declining trend of CRT market. Our profit margin is very low. We need at least 5% profit margin to survive…recycling is a way to keep the cost of raw material down." (Respondent # 15, interviewed on 19 January 2009, emphasis added in square bracket).

According to the representatives from AB and YZ, their involvement in this campaign is a way to fulfil their social responsibility, although they did not deny that the involvement has some economic benefits to their business' development such as free advertisement of their service. Financial incentives are also an attraction for householders to participate in this campaign. Therefore, based on four cases brought forth, a conclusion can be reached that economic reason is behind the involvement of PSAs in persuasion mode of e-waste governance.

### 6.3.3 Self-governance of E-waste by PSAs

In a situation where the role of state actors is absent, insufficient or ineffective, it is not unusual for non-state actors to adopt self-governance modes to overcome the shortcomings. Self-governance is a situation where governing of any salient issue is done without the 'purview of government' (Kooiman and Jentoft 2009: 821, Kooiman 2003). In this section several examples where PSAs manage e-waste without the intervention from state actors are discussed. Two types of PSAs which are involved in self-governance of e-waste are the electrical and electronic equipment manufacturing companies and retailers/departmental stores. Evidence from this research suggests that reasons

for their involvement in self-governance mode are obligation under company's policy and as CSR measures; which are influenced by the combination of the presence of law and the pressure of other actors. According to Auld et al. (2008) CSR is initiated by pressures and threats of NGOs and the government. Self-governance is an example of how modes of governance are interrelated to each other where persuasion mode adopted by NGOs led to self-governance by PSAs, which is monitored by hierarchical mode by the government or third party such as internal and external audit team. Self-governance also demonstrates the multiplicity in the actors involved in governance (PSAs, NGOs and the government) which goes beyond the boundary of a sovereign country.

Three examples of PSAs involvement in self-governance mode are brought forth in this thesis; the first example involves managing of e-waste which is generated in the operation process of manufacturing companies; the second example is the management of end-of-life products by manufacturing companies; and the third example is related to the management of e-waste which is generated by the customers by retailers/departmental stores. Several PSAs in Malaysia have taken actions to self-govern e-waste which is produced by their own organizations. These e-wastes include the end-of-life equipment, faulty equipment or manufacturing by-products (including faulty parts and discontinued models) (Respondent # 10, 12 November 2009). Two companies, for example have set up in-house waste minimization policies which include a regulation which stated that only electrical equipment which is beyond repair should be replaced (Respondent #12, 22 January 2009; Respondent #22, 1 March 2009). This is a two prong policy; firstly, it is an attempt to reduce operating expenditure, and secondly, to reduce the generation of e-waste. In another example, a Japanese manufacturing company developed a system (called Green Procurement System) as a 'gate-keeper' to ensure that only suppliers which conform to the RoHS requirements on chemical substances are chosen to supply parts and components to their company (Respondent # 11, 19

January 2009). This mechanism ensures that their products will not pose environmental and health threats upon end-of-life. Another Japanese manufacturer is governed by a very stringent policy imposed by the mother company in Japan which is known as 'Eco Ideas'. Under its Eco Ideas Policy, the holding company sets a very strict waste generation limit to every branch offices in an attempt to reduce the production of e-waste of the whole group of companies (Respondent # 12, 22 January 2009). This is an example of how self-governance mode is intertwined with hierarchical mode of governance. Elements of multi-level governance are also apparent from the cases above as it involves companies which are located in different countries and involves multiple actors.

Besides governing their own e-waste, several manufacturers in Malaysia are governing e-waste generated by their customers as a part of responsibility towards their products which have reached its end-of-life. The growth of self-governance in the EU is induced by the introduction of WEEE directives; while the increase in USA in due to strong pressure from the NGOs. For example, the 'naming and shaming' actions of NGOs in USA have resulted in the launching of worldwide voluntary take-back schemes by Dell (Wood and Schneider 2006). As such, Dell's branch in Malaysia introduces an online recycling facility and receives all brands of computer and computer peripherals for free recycling, and offers payment for customers who recycle unwanted Dell branded products (http://www.dell.com.my). The factor of customers' convenience is given consideration in this programme and Dell provides free collection, upon receiving some information on contact and pick up details together with preferred collection date which can be done online. Other than Dell, two well-known mobile phones manufacturers, Nokia and Motorola also adopt self-governance mode by providing disposal facilities for the users of their products. Nokia's recycling facilities called 'Nokia Kiosks' was started in 2001. 'Nokia Kiosks', however, are available only in three cities nationwide (Kuala Lumpur, Petaling Jaya and Puchong) (www.nokia.com.my/nokiakiosk)

(see Plate 6.1). Another mobile phone manufacturer, Motorola provides recycling opportunity for the user of their mobile phones in a programme called ECOMOTO Take-back (www.motorola.com) (see Plate 6.2). Information on the Motorola website states that there are seven collection points for customers to choose from, but in reality (based on my observations which were confirmed by an officer from the company who declined to be named or to take part in a full interview) there are only two (in Penang and Petaling Jaya). Both Nokia and Motorola's efforts target society at large. Besides the influence of their experience in the Global North, these programmes are partially the result of failed negotiations for a partnership with the DOE (Respondent # 2, 27 November 2008). The negotiations ended with all the three parties (DOE, Nokia, Motorola) operating their own used mobile phones collection programmes.

All these initiatives, however, are more impressive on paper than in practice. Based on conversations with several people from the private sector, it was evident that the programmes by Dell, Motorola and Nokia are not well known and thus not widely used (Respondent # 22, 1 March 2009; Respondent # 26, 4 March 2009). This may indicate that the PSAs' involvement in self-governance of e-waste is merely to fulfil their obligations to company's CSR and policies, and to avoid further 'naming and shaming' actions from the NGOs; instead of to protect the environment from e-waste pollution. Other than manufacturers, a few electrical and electronic device retailers in Malaysia adopt self-governance mode to govern e-waste produced by their customer. Retailers such as Bangsar Village in Kuala Lumpur and Digital Mall in Petaling Jaya allocate space for customers to drop off their e-waste (see Plates 6.3 and 6.4). Collected devices are sold to licensed e-waste contractor for proper disposal and recycling.


Plate 6.1: Nokia drop-off bins for mobile phone recycling in The Curve Shopping Centre, Petaling Jaya. (Source: author)


Plate 6.2: Motorola drop-off bins for mobile phone recycling at the entrance to Motorola's Petaling Jaya office . (Source: Motorola (Malaysia))


Plate 6.3: A poster on e-waste recycling facility in Digital Mall, Petaling Jaya. (Source: author)

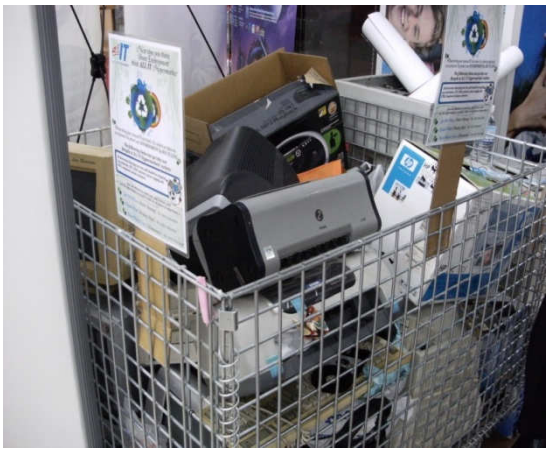


Plate 6.4: E-waste collection/drop off point in Digital Mall, Petaling Jaya. (Source: author)

Although PSAs are adopting self-governance in managing e-waste, intervention from other actors to monitor the operation of the arrangement would be beneficial, especially if self governance is used by individual company (rather than the branch of an international company). Such forms of oversight are important to avoid e-waste falling into the wrong hands. According to Interpol Pollution Crime Working Group (Phase II) Report (2009), electrical and electronic equipment take-back schemes (of the type required by the WEEE Directive) have led to illegal activities in Holland and the UK, where criminals buy the returned equipment from shops (or sometimes get paid to take it away), under the pretence of re-use or recycling, and then ship it for illegal disposal. According to the report, the usual methods of illegal export of e-waste from the UK is through mislabelling of containers (often as personal items) or mixing e-waste with other commodities such as second hand and end-of-life vehicles. Although illegal export may not be the case in Malaysia, e-waste collected through self-governance mode may be sold to unlicensed scrap dealer due to its value, opening up the possibilities of improper e-waste treatment and disposal process.

### 6.3.4 The Involvement of PSAs in E-waste Governance: Limitations and Implications

As discussed Section 6.2, PSAs in Malaysia have been given an opportunity to be included in the law formulation process. However, the disputes between the state actor and PSAs in the process of formulating law on take-back scheme (Environmental Quality [Recycling and Disposal of Electrical and Electronic Equipment] Regulation 20__), has halted an important process in household e-waste management in Malaysia. The longer it takes for both parties to reach an agreement, bring an important implication; the possibility of exposure to e-waste pollution among members of the society is being prolonged. The fact that the state actor agrees on deeper deliberation as requested by the PSAs, despite the dominance of government in Malaysian politics (as apparent in the

case of centralization of solid waste management services studied by Agamuthu et al. [2010] see Section 3.3.3), signifies that PSAs are perceived as important governance actors; which could be related to its contribution to the country's economic development. But, more important than the process of formulating a law is to ensure that it is implemented strictly. According to Widmer et al. (2005) and Streicher-Porte (2005), lack of effective enforcement of law is the reason for failure in hierarchical e-waste control in many countries. However, certain PSAs, such as the branches of international electrical and electronic equipment manufacturers, are obliged to comply with the policy determined at headquarters level which is located overseas. The involvement of PSAs in top-down intra-firm e-waste governance which transcends beyond the boundary of sovereign states allows for the involvement of local PSAs into global environmental politics. In certain cases, intra-firm hierarchical mode of governance induces the birth of self-governance mode. Thus, conclusion can be made that the role of PSAs in hierarchical mode of governance, which is intricately linked to self-governance mode and intertwine with the multilevel governance perspective, has an important impact to e-waste governance and global environmental governance.

PSAs' involvement in persuasion mode of governance includes dissemination of information on safe disposal of e-waste and providing recycling facilities in some cases. All PSAs which are involved in persuasion mode in this research are doing so for economic-related self-interests reasons such as to obtain raw material at lower cost than mining of virgin material and to attract customer to their core business activity, rather than environmental concerns. Persuasion mode of governance has not been very successful, due to the economic value which is attached to e-waste (Visvanathan and Norbu 2006). Most people prefer to sell their e-waste to scrap dealer without giving any concern of its environmental effects. As such, one particular company gives out cash incentive as inducement to increase the level of success rate. As identified in past research (see for example, Darby and Obara 2005), cash incentive has

increased the rate of recycling. Persuasion mode of governance in the Global North (such as 'Reduce Your Rubbish' campaign in New Zealand in Davies 2008), where waste is not attached to economic value, but rather as a 'crisis' that need to be tackled (Friends of the Earth 2002, in Riley 2008) has the potential to produce a better result. Therefore, adaptation of persuasion mode of waste governance in the Global South needs to be specially designed with considerations for cultural perceptions, to ensure that it is suitable.

Two factors which have been influencing self-governance of e-waste by PSAs in Malaysia is the increasing 'naming and shaming' actions from NGOs in the USA (see Wood and Schneider 2006) and the introduction of WEEE directives in the EU. These two factors have triggered the growth of CSR and take-back schemes among MNCs; which are then transferred as company policy which all branches are obliged to comply. A study by Ronit and Schneider (1999) on self-governance by the Ecological and Toxicological Association of Dyes and Organic Pigments Manufacturers (ETAD) shows that sanctions have been used for non-conformance and non-compliance of members to the standard code of practice set by the organizations. Self-governance of e-waste by PSAs in Malaysia demonstrates how a blend of three modes (persuasion, hierarchical and self-governance) happens at multiple level of political entity, involving multiple actors.

## 6.4 The Roles of CSOs in E-waste Governance

As mentioned in Section 6.2, Civil Society Organisations (CSOs) in this chapter are referred to legally registered, not-for-profit organizations. CSOs are divided into two categories; the Non-governmental Organisations (NGOs) and the Community based Organisations (CBOs) (see Figure 4.3). Although it is easy to define and divide these actors in theory, in practice the boundaries are often blurred (refer Section 6.2). CSOs play significant roles in e-waste governance in Malaysia, in both the hierarchical and non-hierarchical modes of

governance. The remainder of this chapter discussed how CSOs play a role in influencing and shaping the policy making process (and therefore participate in the hierarchical mode of governance) and in transforming the values and behaviour of society (through the persuasion and self-governance modes).

### 6.4.1 CSOs and their Roles in Policy Making

CSOs have no authority to make policy. However, they may play a significant role in influencing policy making processes, shaping the form and formulation of policy and monitoring policy implementation (Glazebrook 2001, in Schwartz 2004). Lobbying approach is applied by CSOs in Malaysia in seeking to influence policy-making. Lobbying in this case refers to efforts that attempt to influence legislation. In this instance, lobbying is used as a strategy to pressure and influence state actors to act in more equitable and effective ways by formulating relevant legislation to address the roots of e-waste problems. In the cases explored in the context of this thesis, it was mostly done through letter writing. Lobbying through writing is considered the best possible option as requests for a face to face discussion are usually turned down by government officers (Respondent # 49, 13 November 2008), which may signifies that CSOs are not perceived to be important actors in governance by the government. The excuse commonly given to justify the refusal to meet is the tight schedules (of ministers and higher ranking government officers), and therefore communication through letter writing is the only option. This also avoids face to face confrontation which is generally avoided in Malaysia and many other East Asian societies. Street protests are discouraged, as protesters may be detained by the police for causing public unrest and may not be given a trial at all under the Internal Security Act (ISA). ISA also suggests that passive form of lobbying is the most suitable channel possible for CSOs to seek influence in hierarchy.

Between the two groups of CSOs (NGOs and CBOS), NGOs play a more active role in lobbying for the formulation and effective implementation of e-waste related legislation, due to their relatively wider experience and knowledge on the matter. Three NGOs which are particularly prominent in their actions related to e-waste are the Consumers' Association of Penang (CAP), the Federation of Malaysian Consumers' Association (FOMCA), and Sahabat Alam Malaysia (SAM, translated as Friends of the Earth Malaysia). As mentioned in Section 5.2.1, these NGOs gained broad exposure and knowledge on e-waste from their involvement with international groups, which have inspired their actions (Respondent # 49, 13 November 2008; Respondent # 53, 4 March 2009). NGOs have stronger abilities and capabilities to play the lobbying role due to the wide background knowledge of their staff (ranging from molecular science to social impacts and law) compared to CBOs (which accept all community members regardless of education background).

CAP, as a consumer association, is concerned with the marginalized and powerless groups in society such as the scavengers, scrap dealers and low-paid workers in e-waste recycling plants. Triggered by the need to seek and uphold social and environmental justice, and alarmed by the lack of action by state actors in handling issues related to e-waste, CAP (together with SAM) pioneered lobbying actions to pressure the government to formulate a specific law on e-waste control (Respondent # 49, 13 November 2008). They started this campaign around the year 2000 (Respondent # 49, 13 November 2008). For example, CAP and SAM wrote a letter to the Director General of the DOE (dated 23 September 2004) and raised their concerns related to e-waste issues which encompassed justice for the workers in e-waste recycling and material recovery activities (and the public in general), and the proliferation of e-waste trading from the Global North to the Global South. Although CAP agrees that e-waste recycling is an efficient way to avoid the hazardous impacts of indiscriminate dumping, the group also stresses the importance of doing so in the right way (Respondent # 49, 13 November 2008). CAP's concern for the

impacts of e-waste recycling processes to the public's health and the environment was highlighted in another letter to the Director General of DOE (dated 7 November 2003), concerning the environmental impact assessment (EIA) for a proposed e-waste recycling plant in Seberang Perai, Penang. CAP proposed a more stringent law on approving the setting up of e-waste recycling plants, arguing that the proposed plant was located too close to a food manufacturing factory and a river.

Another NGO which is actively involved in e-waste issues is FOMCA. FOMCA, in it website (www.fomca.org.my), claims that it has been playing a very active role in lobbying the government for the formulation of consumer related legislation such as the Food Act 1983, Direct Selling Act 1993, Consumer Protection Act 1999 and Water Services Industry Act 2006. FOMCA, working together with CAP, is pushing the DOE for legislation on Extended Producer Responsibility (EPR) - a policy which extends the responsibility to manage e-waste to the manufacturer. An EPR law is proposed by these NGOs as a means to manage e-waste generated by households, as the existing e-waste law does not have provision related to household generated e-waste. As discussed above and in Section 6.2.1, the drafting of the new Malaysian law (which began in October 2008) is based on the principle of EPR and has involved state and private sectors actors (manufacturers, dealers, services, material recycling and recovery operators) (Respondent # 1, 27 November 2008). Malaysian policy makers in this case have interpreted the law literally as the name suggests - Extended Producer Responsibility - and thus limited the invitation to participate in the policy making process to the producers and businesses related to the products only. NGOs are excluded in this process as their role is seen as irrelevant and their *locus standi* in representing society is seen as questionable (Respondent # 1, 27 November 2008).

Other than lobbying for the law on EPR, FOMCA is also involved in pressuring the government to make it mandatory for all producers to apply the energy efficiency rating practiced by many more developed countries such as the UK and Singapore to all of their products (Respondent # 48, 21 November 2008). This is meant to encourage the public to buy energy efficient products which have a longer life span, which would also lead to less e-waste being generated.

Lobbying for policy formation is a hard challenge in Malaysia. One of the greatest limitations that NGOs face in influencing policy making and policy implementation in Malaysia is a government which is claimed by NGOs to be too 'authoritarian' (Respondent # 48, 21 November 2008) and 'not as democratic as it should be' (Respondent # 49, 13 November 2008). According to these respondents, much legislation has been formulated without any consultation with the public. On this matter, one representative commented:

> "The people are a nation's greatest resource for developing and implementing laws and policies. Ministries and government agencies should consult NGOs in managing this issue [e-waste] as stated in RIO declaration Principle 10. The law [Environmental Quality (Scheduled Wastes) Regulations 2005] was formulated behind the four walls of DOE's office, that's why it is facing problems in terms of implementation" (Respondent # 49, NGO, interviewed on 13 November 2008, emphasis added in square bracket).

Introduction of e-waste law (Environmental Quality (Hazardous Wastes) Regulations 2005), according to a respondent from the government department, was the result of the department's constant review of existing law and not because of pressure from local NGOs (Respondent # 1, 27 November 2008). From the evidence gathered, it is very difficult to determine whose claim bears more truth. However, NGOs actions are commonly politicized by

the political parties. There are times when an NGOs fight (such as in anti-incineration campaign, anti-centralization and privatisation of solid waste management) has received support from the opposition party, and NGOs are labelled as anti government and their actions are subject to strict government control. This situation is also prevalent in China (refer the works of Shi and Zhang 2006, Martens 2006, and Schwartz 2004 in Section 3.3.2), and many other countries in the Global South where democracy is still emerging as a political system. In Malaysia, this has initiated the government to set up their own NGOs (Government Operated NGO – GONGO) such as SERI and PEWOG (see Section 3.3.2) which is also happening in China.

NGOs' role in influencing policy making in Malaysia is not restricted to lobbying the government; it also involves efforts to shape the policy of PSAs. A CAP representative said during an interview:

> "For the benefit of consumers, we target two groups in our programmes, the government and the private sectors. We want to make sure that relevant policies are in place and the companies are doing it right, and are not sending their e-waste into the incinerator and landfill. And the manufacturers are not using hazardous substances in their products" (Respondent # 49, NGO, interviewed on 13 November 2008, verbatim).

Commercial firms whose policies have an adverse impact on the environment can be vulnerable to consumer boycotts organized by NGOs, which can in turn hurt sales and profit margins. On this issue, a representative from an international private sector company agreed in an interview:

> "We are not very worried about national policies or laws, because our company's stand is never to go against any law in any country that we are operating. We are more concerned and worried with the actions by

> huge international NGOs such as Greenpeace. I heard that our company in India has been badly attacked by them!" (Respondent # 12, PSA, interviewed on 22 January 2009, verbatim).

However, the roles of NGOs in lobbying for the change in PSAs' policies are not as prominent, as, for example, those of NGOs in the USA (Section 3.3.3) because most PSAs in Malaysia are branches of a big company (where the head offices are normally located in the Global North) and have no final say in companies' decision making process. The NGOs action in USA is very much developed in activities and success rate. It is common that NGOs in the USA work in network such as 'Electronic Take Back Campaign' (ETBC) which consists of four NGOs as members; Basel Action Network (BAN), Silicon Valley Toxic Coalition (SVTC), Centre for Environmental Health (CEH) and Clean Production Action (CPA); which increases their strength in terms of man power and other supports. Due to difficulties to get the government to change or formulate national policy, NGOs in USA are shifting their tactics from lobbying the government to naming and shaming of PSAs as a strategy to pressure PSAs to change environmental policies.

### 6.4.2 CSOs and the Persuasion Mode of Governance

Persuasion mode of governance is an action where governance actors persuade members of the society to change their mindset and behaviour on a certain matter in order to achieve specific policy objective (Bell et al. 2010, Bell and Hindmoor 2009) (see Section 3.2.2). In Malaysia, persuasion mode of governance is applied by CSOs in seeking the public to dispose their household e-waste responsibly to avoid pollution and contamination to the environment. Willingness of individuals to change behaviour is paramount determinant to the success of recycling initiatives (Darby and Obara 2005). In the USA, effective persuasion from NGOs such as Silicon Valley Toxic Coalition (SVTC), Campaign for Responsible Technology (CRT) and the

National Recycling Coalition has increase the level of e-waste recycling rate (Lepsoe 2006). Unlike in the USA, there is no specific CBO in Malaysia whose work is centred at the issue of e-waste. However, two consumer association NGOs are pioneering the initiative in persuasion mode of e-waste governance; Consumer Association of Penang (CAP) and Federation of Consumer Association of Malaysia (FOMCA). CAP and FOMCA conduct on-going public education campaign to increase the awareness on the danger of e-waste and target the general public from all ages and ethnic background as according to FOMCA's representative;

> "…people from all walks of life are in one way or another, user of electrical and electronic devices…" (Respondent #48, NGO, interviewed on 21 November 2008, verbatim).

According to Nixon and Saphores (2009), two most influential factors that determine household recycling are knowledge and convenience. Darby and Obara (2005) in their research on household recycling behaviour and attitude of small electrical and electronic items found that 'householders wanted better information on how to dispose of appliances safely' (Darby and Obara 2005:24). Public education campaign is one of the important sources of information on recycling knowledge. CAP and FOMCA disseminate information to the public on e-waste disposal and e-waste recycling by applying two main strategies which are; face-to-face interaction and circulation of printed material. While FOMCA focuses more face-to-face strategies, CAP on the other hand chooses to focus on printed material. The representative from FOMCA believes that their strategy is effective. In an interview, he said;

> "…campaign by NGOs like us is more successful than the government campaigns because we really go down to the field. We went in the village, office, schools to inculcate awareness. Localised, face-to-face

> campaigns are more successful than large scale ones" (Respondent # 48, NGO, interviewed on 21 November 2008, verbatim).

Face-to-face interactions are appropriate to reach more active and interested target groups as this provides the opportunity for questions and answers and deeper explanation. A study by Nixon and Saphores (2009) suggest that face-to-face campaign may be more effective than other strategy, but it is more costly.

CAP, on the other hand, use more printed materials than face-to-face interactions. Printed media are used extensively in information sharing activities which are intended to change the prevalent views in Malaysian society about the importance of proper e-waste disposal. Freely distributed pamphlets, brochures, posters and newsletters are widely used, besides sales of books and magazines which are also common. CAP also sent articles to newspapers to reach their target groups. The same strategy is adopted by an NGO in India, Toxics Link. According to Lepsoe (2006), 'Toxics Link has effectively engaged the media in carrying its message' (Lepsoe 2006:5). Other than that, CAP printed bimonthly news magazines *Utusan Pengguna* (Consumer Bulletin) and *Pengguna Kanak-kanak* (Child Consumer) to educate the public on responsible consumerism, which includes awareness on potential pollution and hazards that they may encounter while handling their unwanted electrical and electronic devices. To ensure that this reaches as broad an audience as possible in a multi-racial country like Malaysia, the news magazine is printed in four editions which are in English, Malay, Chinese and Tamil.

As a conclusion, the role of CSOs in persuasion mode of e-waste governance is still at its infancy stage. There is little amount of effort put and its effectiveness is not studied in this research. Thus, this is one of the areas where future research can be focused on.

### 6.4.3 CSOs and Self-governance of E-waste

Self-governance by civil society in the form of local community-based initiatives is quite common in waste management in developing countries, with the literature on the topic including many examples from India, Bangladesh, Ghana, Burkina Faso (World Bank 2005), Indonesia (Pasang et al. 2007) and Pakistan (Ali and Snel 1999). It arises in response to local conditions where municipal authorities are unable to cope with the rapidly expanding demands of modern and formal waste management systems due to lack of financial capacities, insufficient equipment, staff and expertise (Ali and Snel 1999). Although solid waste management services in Malaysia are much more developed compared to those in Pakistan and Indonesia (Section 2.4), some elements of self-governance of waste by community associations do exist – especially in managing e-waste.

Many community level recycling programmes in Malaysia introduced and managed by CBOs. Most of the recycling programme off by collecting basic recyclables such as paper, glass, metal, and plastic as a community project. Plate 6.5 and Plate 6.6 show recycling centres run by two CBOs in Petaling Jaya. Collection of e-waste was added around the year 2006. This is related to the introduction of e-waste legislation (Environmental Quality [Hazardous Wastes] Regulations 2005) on 15$^{th}$ of August 2005 which classified e-waste as a type of hazardous waste, hence restricting it from being collected by solid waste contractors. Unfortunately, there is no alternative means provided by the government for households to dispose of their unwanted electrical and electronic items, leaving the community at a loss as to how to dispose of such items. Self-governance in e-waste management was developed to provide facilities for the community to dispose of e-waste responsibly in the absence of state action. In this context many CBOs stepped in and offered to collect e-waste from households to prevent indiscriminate dumping (Respondent # 42,

27 February 2009; Respondent # 55, 18 December 2008). Collected items are sold to contractors who are licensed by the DOE to manage e-waste.

Plate 6.5: Recycling centre run by Petaling Jaya Residents' Association (PJCC) in Seksyen 17, Petaling Jaya (Source: author)


Plate 6.6: Recycling centre in Bandar Sri Damansara, Kuala Lumpur which is run by Bandar Sri Damansara Residents' Association (BSDRA) (Source: author)

The reasons for the involvement of CSOs in self-governance mode of e-waste management varies widely, including environmental concerns, a way to strengthen unity among residents, to expand the existing recycling programme and for charity purposes. For example, one respondent mentioned in an interview session that his organization decided to employ self-governance of e-waste for environmental reasons, and that e-waste collection branches out organically from the existing recycling programme.

> "When we started [operating the recycling centre] about 6 years ago, we only collect paper, glass, aluminium cans and plastic…but lately people start bringing in computers, printers and other electrical items…we thought why don't we collect e-waste as well. We know we should not let it go into the normal waste stream, because it can be dangerous. So, we started to receive e-waste at our centre too…because

> if not, the residents will just throw them into the Alam Flora [solid waste management company] bin." (Respondent #44, CBO, interviewed on 27 November 2008, emphasis added).

Another respondent from a CBO cited a different reason for the organisation's involvement in self-governance of e-waste. According to him, the organization that he represents opted to practice self-governance of e-waste as a community project (which is conducted every fortnight, on Sunday morning), to increase bonding among community members. In an interview, he said;

> "We want the community to know each other better. We conduct projects to bring community together. For example, we have *tai-chi* [oriental morning exercise] in the *padang* [field] in front of the *tasik* [lake] every Friday morning. But, people who work cannot come, that's why we create another alternative. And e-waste recycling seems to be a suitable project." (Respondent #35, CBO, interviewed on 18 November 2008, partly translated where needed as interview was conducted in a mix of Malay and English languages).

However, collection of e-waste is not always solely driven by environmental and health reasons; some are driven by a spirit of altruism. One particular CBO in Petaling Jaya for example, collects unwanted electrical items to be repaired, and puts them on the market as second hand items. The profit made from such sales is used to help the needy in several charity homes (Respondent # 45, 1 April 2009). The concept of recycling for charity is not very common in Malaysia, but has been well accepted in the UK (Curan and Williams 2010, Horne 2000). Horne (2000), identifies two levels of charity recycling in the UK; the first level is where donated items are sold as it is (or termed 'reuse' in waste management hierarchy), and the second level is where donated goods which are not in saleable conditions are converted into resalable condition before putting into the market. This two-layer system of charity recycling as

practiced in the UK is similar the system applied by the Malaysian CBO; however, the item involves in the process in Malaysia is limited to electrical items only due to the high cost of new items. The recycling and re-use of bulky items (furniture and electrical items) in England and Wales is studied by Curan and Williams (2010). Curan and Williams (2010) argue that the involvement of CSO as collector and re-distributor of the used furniture and electrical items (on behalf of the Local Authority) has been successful in achieving two targets; to relieve hardship and improve waste management practices.

Two main obstacles facing CBOs in self-governance are lack of funding and space. As non-profit organisations, CBOs and NGOs face difficulties in raising sufficient fund to run their programmes, such as to pay for the cost of printing (of brochures, posters and pamphlets) and communication (via telephone or internet) (Respondent # 50, 27 February 2009). Besides funding, space is also a problem as most of the CBOs do not have a proper office. Collection of e-waste is normally carried out in a communal space, such as a school compound, play ground or a place of worship such as a church or *surau* (Muslim prayer hall). Items are kept in storage (usually at the house of the president) until a reasonable amount has been collected; only then is an arrangement for collection made with the e-waste contractor (Respondent # 37, 1 March 2009). A respondent in Penang expressed their predicament in an interview:

> "Space is the biggest problem. Because this is a *kampong* [village] area. The housing pattern is scattered, not like housing estates which is easier. We used to gather the collection of recyclable items on the 2nd week of every month at the *surau* [Muslim prayer hall] but now we received complaints that this activity has messed the area. So we are not allowed to carry out that activity here anymore. Now I am doing the collection from my own house. We don't have a specific place to put all the collection." (Respondent # 40, CBO, interviewed on 2 March

2009, partly translated where needed as interview was conducted in a mix of Malay and English languages).

### 6.4.4 The Limitations and Implications of CSOs Involvement in E-waste Governance

As discussed above, CSOs in Malaysia are involved in the hierarchical, persuasion and self-governance of e-waste. NGOs' involvements in hierarchical mode in lobbying for policy action are highly constrained by the state. Although some actions have been taken by state actors, which relate to NGOs lobbying actions, there is little evidence to claim it as the success of NGOs actions. The establishments of GONGOs are proof that government want to have more control on NGOs activities. As a result, NGOs in Malaysia are slowly changing their tactics in relation to the hierarchical mode by lobbying for the changes in PSAs policies, however this has not produced any significant outcome. CSOs actions through persuasion and self-governance modes are hindered mainly by financial constraints, particularly in spending for effective publicity through various media (in persuasion mode) and paying for disposal and treatment (in self-governance mode). Therefore, cooperation between CSOs and PSAs has the potential to overcome this problem in e-waste governance by the CSOs.

## 6.5 Conclusion

Interventions by non-state actors in e-waste governance through multiple modes of governing (hierarchical, persuasion, self-governance and co-governance) have been induced by a combination of factors, but mainly; lack of and ineffective traditional hierarchical governance by state actors, inspiration drawn from the experience of like-minded bodies (in the case of NGOs and CBOs) or overseas offices (in the case of private sector actors), and current e-waste governance trends in the Global North (which is built on a

combination of several factors such as the introduction of EU Directives [WEEE and RoHS], the proliferation of the EPR principle and the increasing interest in Corporate Social Responsibility [CSR]). In this chapter, the modes of governance were analysed to understand the roles of non-state actors in the governance process. However, it is important to recognize that the boundary between governance modes in some approaches may be less distinct than others. An example is the self-governance mode of PSAs (Nokia, Motorola and Dell) (see Section 6.2.3), where PSAs provide an avenue for their customer to dispose of their end-of-life products responsibly. This effort can also be viewed as a form of persuasion from another perspective. This indicates two things: firstly, that multiple modes of governance occur at one particular time and secondly, one particular governing approach might have multiple categorization modes depending on the different lenses used. However, amidst these complexities, the ultimate objective of the interventions is to guide society in ensuring proper disposal of e-waste, hence minimizing the negative impacts that the process may bring to the environment and society. On these grounds, success must be viewed as limited thus far.

Among the four governance modes in which PSAs are involved, the self-governance mode is the most significant. Self-governance of e-waste by PSAs (which is expanded beyond governance of individual PSAs to include collection of their end-of-life products from consumers) has enabled the public to practice the responsible disposal of e-waste in the absence of hierarchical control (and associated facilities) from the government. However, the existence of these facilities is not widely known to society at large due to a lack of publicity, and weaknesses in the persuasion mode of governance. A combination of two modes – effective persuasion mode (including active announcement and advertisement in printed and electronic media) and (geographically) widespread self-governance mode by PSAs – has the potential to fill the void in e-waste governance which exists due to government failure. The role of PSAs in hierarchical mode of governance via their influence in

shaping the formulation of law is becoming stronger over time, reflected in their involvement in the drafting of a new law (on collection and recycling of household e-waste).

CSOs have also been active in e-waste governance, however their role is slightly limited. Their most significant contribution (among the four modes of hierarchical, persuasion, self-governance and co-governance modes) is through the persuasion mode. Self-governance of e-waste was started by CSOs due to the lack of infrastructure for e-waste disposal provided by the government. In order to encourage and facilitate the public to dispose of e-waste responsibly, CSOs have conducted individual e-waste collection programmes. Although the volunteers are very committed, e-waste collection programmes are not a big attraction to the public. Another mode of governance where CSOs are making an impact is the hierarchical mode. The lobbying approach to influencing government policy making is a slow and bumpy journey in Malaysia. In fact, lobbying at times can be counterproductive if the issue raised is politicized by political parties and politicians. As a young nation, democracy in Malaysia is not as transparent as practised in the West. The availability of a wider space of democracy and recognition of public participation could possibly act as a lubricant for CSOs to excel as lobbyists.

The involvement of non-state actors in e-waste governance has left a substantial mark in environmental governance in general. Their involvement has not taken power away from the government, but instead has strengthened the governance process by playing complementary roles in e-waste governance, by filling the gap left by state actors. Although the intervention of non-state actors may not have been able to compensate for all the weaknesses of the state actors (as drawn from discussions in this chapter), it has proved that multiplicity (in terms of actors and modes) in the governance process is a crucial factor in environmental governance in Malaysia. This however, could

be done to a better level should society and government be more open to this new (for Malaysia) approach to governance.

# Chapter 7: Governing E-waste through Public-Private Partnerships (PPP)

## 7.1 Introduction

Managing e-waste is a challenge for the government and other stakeholders. Multiple modes of governance involving various state and non-state actors (as discussed in Chapter 5 and Chapter 6) have emerged to manage e-waste which is generated from two main sources: industries and households. However, issues of illegal and indiscriminate dumping of e-waste still prevail, which could lead to pollution of the environment and exposure of members of society to various health hazards. From the analysis in Chapter 5 and Chapter 6, a preliminary conclusion can be made that there is no single actor who has sufficient potential, power, capabilities and expertise to solve e-waste disposal problems on their own. Hence e-waste stakeholders have to rely on each other and establish modes of co-governance. There are examples of actors working in such a co-governance mode in the management of e-waste in Malaysia, such as the campaign on CRT recycling by three PSAs as discussed in Chapter 6. As there are overlapping characteristics between the co-governance and the persuasion modes in this example, it is discussed under the persuasion mode (in Chapter 6), while this chapter seeks to investigate how a variant of co-governance – Public-Private Partnerships or PPPs – can be applied in managing e-waste generated by households in the context of Malaysia. PPPs have been chosen as the focus of this chapter in an attempt to comprehensively understand the roles of different actors in e-waste governance as PPPs involve both state and non-state actors, compared to other co-governance modes (such as communicative governance, co-management, regimes and network as identified by Kooiman (2003); see Section 3.2.2).

The emergence of partnerships between the government, private sector actors and citizens is one of the most common themes in current discussions over environmental governance. Although the concept of partnership is said to be

unstable in terms of 'definition, distinction and containment' (Davies 2002: 190), and lack of empirical underpinnings (e.g. Hudson et al. 1999), it has nonetheless been widely used in managing environmental issues in an attempt to materialize sustainable development goals. Partnership has been accepted as a new political domain involving various actors in environmental policy formulation and implementation, as a mechanism for governance where command and control mechanisms have failed, and as a means to increase the effectiveness of public services where the abilities of the state are restricted or limited.

PPPs are also commonly praised for their ability to introduce a democratic element to environmental governance as they offer an opportunity for participation by non-state actors in the governing process (Smismans 2006). Another aspect of PPPs which is commonly highlighted is the interdependency of actors; where actors pool different resources (based on their different abilities) to be shared with other partners in running a programme. In the operation of PPPs, actors retain their operational autonomy in the sense that they are not commanded by superiors (Sørensen and Torfing 2009) in playing their various roles, and they share the risks and benefits from the process.

This chapter seeks to explore how far the claims above are true in PPPs in Malaysia, based on two case studies. Moreover, as the claims are made in the context of more economically developed countries in the west, this chapter intends to investigate the suitability of importing the concept to be applied in less economically countries such as Malaysia. Two PPPs, one in Penang (a state in the north of Peninsular Malaysia) and one in Petaling Jaya (hereafter PJ – a town in the state of Selangor) were selected as case studies. Each of these case study PPPs involved government departments at the local level and non-state actors from the private sector and civil society, in a joint effort to ensure proper disposal of household computers. The partners in these two PPPs, as the chapter will make clear, bring different skills and capabilities to the

partnerships, and are motivated by different desires and have different aims. This offers a suitable context to illuminate the question which this chapter seeks to answer: how do different partners interact and play their roles in each PPP, and what are the implications of this interaction for each PPP?

Based on these questions, interviews were conducted to gather information from the actors involved. This chapter begins with an analysis of the emergence and entry of PPPs in to the landscape of e-waste governance in Malaysia (in Section 7.2). This is followed by descriptions of the two PPP case studies in Penang and PJ (in Section 7.3), focussing on the differences between the cases. The results of the analysis come next, where discussion focuses on how multiple actors interact and play their different roles in the PPPs, and the impacts and implications of their actions (Section 7.4 and Section 7.5).

## 7.2 PPPs: Their Emergence and Entry Into the Landscape of E-waste Governance

As discussed in Chapter 3, public-private partnership (PPP) programmes proliferated in the 1980s due to increasing recognition of the interdependencies between state and non-state actors in the governance process (De Angelis 2003, Kooiman 2003). Among the main reasons for the application of PPP in governance are to address the government failure in providing services and to increase democratic participation in governance process. In the more economically developed countries such as the UK, the PPP concept was applied most extensively by the local governments in the development and regeneration of cities in the United Kingdom during the 1980s to 1990s, and is seen as a way to strengthen local governance structures (Edelenbos and Teisman 2008, McCarthy 2007, Davies 2002, Darlow and Newby 1997). In many less economically developed countries (such as Bangladesh – refer the work of Ali and Ahmed (2006), and India and Philippines – refer Forsyth (2006, 2005) as discussed in Section 3.4.3), PPP is used as a common means of

implementation of development agendas, providing environmental infrastructure, and service provision where 'state funds or expertise are lacking' (Forsyth 2005: 429). Savas (2000) sees PPP as a collaboration that maximizes the different strengths of the partners to the benefit of the people, based on the idea that the state actor's role is to 'steer' and not to 'row'.

Besides addressing the government failure, PPP is applied in policy formulation and implementation as a means to address the low levels of democratic participation and to avoid social exclusion (Putnam 2000), hence making policy-making process more legitimate. However there are many debates from governance scholars regarding this matter. For example, based on research in the field of occupational health and safety in the EU, Steffek and Smismans (2008) and Smismans (2006) raised two related concerns; firstly they revealed that there is no guarantee that PPP will be more participatory and inclusive, and secondly the rise of powerful private sector actors (resulting in lack of equality as some more resourceful actors are deemed to be more privileged than other actors) have exacerbated (instead of mitigated) democratic deficit. Bell et al. (2010) and Bell and Hindmoor (2009) critiqued on the selection of participants in PPP may not always be democratic, and stressed on the need for more transparency in PPP to enable it to be a democratic governing tool.

In Malaysia, PPP (involving a combination of actors from the public sector, PSAs and CSOs) has emerged as the chosen mode to govern e-waste generated by households. There are three situations which have initiated this. The first is the existence of a gap in delegation of power and responsibilities among government agencies in managing the collection and disposal of e-waste from households. The Malaysian government allocates the power to manage household waste (excluding household hazardous waste) to the Ministry of Housing and Local Governance, and the power to manage hazardous waste (but not including the collection of household hazardous waste) to the Ministry

of Natural Resources and Environment. E-waste is stipulated under Malaysian law (Environmental Quality (Scheduled Wastes) Regulation 2005) as a type of hazardous waste. As such, the delegation of power and responsibilities as mentioned above has left the collection of e-waste from households under the responsibility of neither of the ministries.

This led to the second situation; improper disposal of e-waste by the public. Due to the lack of facilities for disposal and a lack of knowledge regarding proper disposal, the majority of household e-waste is dumped together with other household wastes and ends in landfill, or channelled to the informal recycling activities which also ends up in landfill. As discussed in Chapter 2, these actions have the potential to cause significant environmental and health hazards, as the hazardous substances in electrical and electronic item may leak into the wider environment while workers in the informal recycling sector may be exposed to such toxic substances. Indiscriminate dumping of electrical and electronic equipment proliferated from early 2000 due to the introduction of newer technologies which have made many items obsolete.

The third situation which has triggered the initiation of PPPs in e-waste governance was a particular local-level event in the state of Penang. The state government of Penang has a keen interest in e-waste management, and appointed two GONGOs (SERI and PEWOG – see Chapter 3 for details on the organisations) to conduct research on e-waste disposal in the state in 2004. The findings of the research indicated that the public have no means to dispose of e-waste properly, and are therefore forced to discard such waste together with other household waste, or to sell it to the door-to-door scrap buyer (*'orang surat khabar lama'*) who dismantle the equipment, extract the working parts and precious metals, and dispose of the remainder in landfills or dumpsites. Based on this knowledge, the Penang state government initiated the first PPP to govern e-waste under the banner of the LA 21 commitment of Penang Island

Municipal Council (Respondent # 55, 18 December 2008), which is discussed in the following section.

## 7.3 PPP Case Studies: The Computer Recycling Programme

This section describes the background of two PPP programmes on e-waste governance in Malaysia, outlining the actors, their different roles, and the structures of the programmes. Two partnerships at local level were selected as case studies; one PPP in Penang and the other in PJ. Both PPPs are tripartite partnerships (involving the state actors, PSAs and CSOs), and are a part of the Local Agenda 21(LA 21) agenda of the municipalities involved. The PPP in Penang was chosen because it was the first PPP on e-waste governance in Malaysia. The PPP in PJ was chosen because it is a replication of the Penang's programme, in terms of concept, structure and organisation. However, the PPP in PJ involves a smaller number of actors and gives out cash incentives (instead of shopping vouchers as used in Penang) to programme participants. Therefore, these two PPPs were chosen to examine how the similarities and differences might affect the operation and outcome of the programmes.

### 7.3.1 The Computer Recycling Programme in Penang

The state of Penang is one of the most developed states in Malaysia and has been dubbed 'the Silicon Valley' of Malaysia. Penang is governed by two local authorities, namely the Municipal Council of Penang Island (MPPP) and the Municipal Council of Seberang Perai (MPSP). Penang state, in contrast to the rest of Malaysia, has a relatively high level of concern about waste management and is leading in many activities related to recycling and waste management. This was evident in 2000 when the Penang State government set up a consultative platform called the Penang Local Government Consultative Forum (PLGCF) to provide an avenue for the residents to discuss issues related to local government including environmental issues. Five working groups

(each related to a specific issue) were formed; they are environment, housing, public education, governance and transportation working groups. The Penang Environment Working Group (PEWOG) is one of the groups which was formed under the environmental working group, and is the only group that remains operational today.

PEWOG plays a significant role in the management of waste in Penang. Its main mission is to assist the Penang state government and the Malaysian federal government to achieve a clean and safe living environment for the people of Penang and Malaysia (http://pewog.org). PEWOG operates in the form of a consultative and cooperative tripartite (LA 21) forum, providing a platform for community, government and the private sector to work together in areas of environmental concern within the context of development. It is made up of more than 25 individuals and organisations from the community, government and private sector in Penang. The chairman of PEWOG in 2009 was Dato' Dr. Ong Hean Tee, who was also the State Recycling Programme Coordinator. It is significant, as we will see, that Dato' Dr Ong is a very experienced and influential politician and a former EXCO (State Executive Council) member in the Penang state government. He is also the chairman of the Penang Island Neighbourhood Watch Association (*Rukun Tetangga*).

Penang started seriously to manage e-waste starting from 2004, when an internal survey was commissioned by the (then) Right Honourable Chief Minister of Penang, Tan Sri Dr. Koh Tsu Koon, out of concern over the impact of electronic and electrical waste on the environment of the state. The study conducted by two GONGOs, SERI and PEWOG, revealed that facilities to dispose of e-waste generated by the community were lacking. Reacting to the results of the study, the state government of Penang through MPPP and MPSP approached Dell to form a public-private partnership to facilitate the recycling of computers. The partnership involved the two municipalities (MPPP & MPSP), Dell Asia Pacific Sdn Bhd. and Dell's e-waste contractor, HMR

Resources (Malaysia) Sdn. Bhd. The MPPP programme was launched in 2004, adopting the drop-off method at collection centres managed by the municipalities. A similar programme in MPSP was launched in 2005, but unfortunately, it faded away and has been inactive since 2007 (Respondent # 55, 18 December 2008).

In 2006, the partnership in MPPP was revamped and rejuvenated to include new partners. The tripartite partnership was launched in 2006, with participating organizations comprising of MPPP, Dell Asia Pacific, Sunshine Wholesale Mart, PEWOG, IRM (Dell's e-waste contractor), six CBOs and two NGOs, and was called the 'MPPP – Dell PC Recycling Programme'. To encourage the public to participate, financial incentives were introduced. IRM pays RM0.50 (£0.10) per kilogram of e-waste, paid in the form of Sunshine Shopping Vouchers to participating citizens and RM30 (£5.50) per month to the collection centres. The partnership's initial target was to collect 10% of unused computers in Penang Island, or about 21,000 kilograms, which was increased to 15% or 31,500 kilograms in 2009. The partnership collected 11,580 kilograms in 2006, increasing to 14,280 kilograms in 2007, and almost reaching the target of 20,600 kilograms in 2008 (Respondent # 55, 18 December 2008). Plates 7.2 to 7.6 show collection centres in Penang.

### 7.3.2 The Computer Recycling Programme in PJ

The concept of partnership in the management of the disposal of used computers was then replicated (in terms of concept, structure and organisation) in PJ at end of 2006. However, quite contrary to a normal partnership, this arrangement was initiated by the private sector – by Dell. Dell approached MBPJ to set up a similar partnership, based on their experience in Penang (see Plate 7.1; a collection centre in the compound of MBPJ's office). In this partnership, cash incentives were provided to encourage public participation. IRM paid RM0.80 (£0.15) per kilogram to the collection centres, with half being kept by the participating collection centres and the other half being paid to the public. According to the representative from MBPJ, they had received many invitations to work in partnerships from the private sector prior to Dell's offer. However, none of the companies was able to prove that their method of disposing of e-waste was not causing pollution to the environment. The decision to work in partnership with Dell and IRM was taken after officers of MBPJ went to visit the IRM premises in Penang and were satisfied with their proper way of handling e-waste.

Plate 7.1: Collection day at Menara MBPJ on 28th February 2009. The men are staff of IRM. They waited from 9 a.m - 12 p.m and went back to Penang empty handed. (Source: author).

Plate 7.2: Collection day at MPPP office in Padang Kota Lama, Penang on 6th March 2009. There is no sign at all to indicate location of collection. (Source: author).


Plate 7.3: Collection point at Sunshine Farlim Hypermarket on 5th March 2009 was manned by the IRM staff. They collected one computer after three hours. (Source: author).

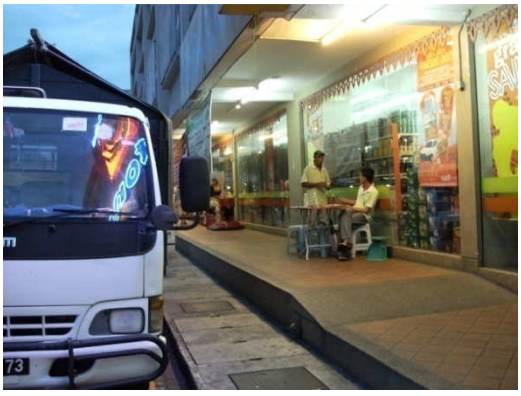


Plate 7.4: Two IRM staff on collection day (3rd March 2009) at Sunshine Jelutong Supermarket. (Source: author).


Plate 7.5: Collection centre in Batu Lanchang Penang is actually someone's house. (Source: author).

Plate 7.6: MPPP's store in Kampung Jawa is another collection centre in Penang. (Source: author).

Subsequent to the visit, as IRM has managed to fulfil MBPJ's standard and requirement of environmentally sound disposal of e-waste, MBPJ extended the invitation to all community organizations in the PJ area to be involved in the programme. Seven CBOs and one NGO agreed to participate. However, a few turned down the offer, as according to the representative from MBPJ, they could sell the e-waste at higher prices to scrap buyers compared to what they will get from the programme. This disappointment was expressed by the officer during the interview. He said;

> "Although we encourage all community collection centres to participate, I must tell you that there are groups who prefer to sell it to individual vendor for better return although they are not aware and bother about how the vendor treats the e-waste." (Respondent # 8, Government, interviewed on 26 November 2008, verbatim)

This implies that the decision to be involved as partners in the PPP is determined – at least for some CBOs - by economic factors rather than environmental concerns. Recycling as it is understood is a means to gain money to fund the organisation's activities. However, as we can see later in

Section 7.5, several CBOs stated that they did not receive the invitation as claimed by the MBPJ; which signifies some level of dissatisfaction among potential partners. Finger pointing between representatives from the government and the CBOs shows that frictions among actors occurred and this may weakened the PPP; where this chapter now turns.

## 7.4 The Interaction of Multiple Actors and its Impact

One of the most essential elements in co-governance is the recognition of mutual interdependencies of partners by means of co-operation (Kooiman 2003, Kouwenhoven 1993). One variant of co-governance – PPPs – operates based on the principle that partners co-operate in the governing process autonomously (without giving up anything of their identity), by exploiting mutually available resources to reach a common and win-win outcome (Kooiman 2003). This section seeks to discuss issues of interaction among the actors in the two PPP case studies. Several issues which have the potential to shake the stability of a PPP, hence affecting its operation and performance, surfaced from the interviews with multiple actors. Discussion begins by focusing on the power struggles and conflicts among representatives, followed by an analysis of interdependency and interaction between PPP partners before ending with a closing remark on how these have affected the operation of the PPPs as a governing mode.

### 7.4.1 Power Struggles, Tensions and Conflicts

In both the PPPs in Penang and PJ, state actors are represented by the local authority, or more specifically the head of the department in charge of the implementation of LA 21. In Penang, the responsibility goes to the Department of Town Services while in PJ the Department of Town Planning is in-charge (Respondent # 6, 16 December 2008; Respondent # 8, 26 November 2008). In most cases where the state is involved in PPPs in Malaysia, state representative

will act as the leader or coordinator of the programme. As such in both case studies (PPPs in Penang and PJ), the heads of the said departments are assumed to be the coordinators of each PPP, hence holding the power to lead the PPP although in neither case was there any official appointment or agreement to this effect.

This arrangement has caused strains in the Penang PPP. This is because the officer representing the local authority has shown a lack of interest in the PPP, and at the same time has not been willing to share power to lead and coordinate the PPP with partners who might be more committed. Below is his reply when asked about his opinion of the PPP:

> "For us, this programme is just an extra work, unnecessary burden. It is just a waste of time and money" (Respondent # 7,Government, interviewed on 6 March 2009, verbatim).

His lack of knowledge about the PPP is apparent in the following response regarding the target group of the PPP.

> "The programme's target groups are offices, government and corporate, and definitely not individuals. To target the individuals is just not suitable. We can collect from the offices, and let the offices know that we have the avenue to recycle computers. Not collecting them from the public." (Respondent # 7,Government, interviewed on 6 March 2009, verbatim).

These statements show that the officer concerned did not share any great enthusiasm for the programme – quite the reverse – and indeed, seemed to lack essential, basic knowledge of its aims and objectives. The PPP was specifically designed to tackle the problem of lack of facilities for collection of e-waste generated by households. We can surmise that this lack of interest and

knowledge on the part of a key actor in the partnership will weaken the PPP. Indeed, it was the reason for the collapse of one PPP in the district of Seberang Prai (Respondent # 55, 18 December 2008). The sentiment that 'government lead and others follow' is very strong among the staff of the concerned government agencies. State actors believe that the baton of power is in their hands and they are not ready to share power with other partners. This is common in PPPs where states are known to be reluctant to share power with other partners (Bell and Hindmoor 2009, Ahmed and Ali 2006). Several partners expressed their disappointment during interviews regarding the role played by MPPP (especially regarding its inability to coordinate the PPP effectively), although most were unwilling to express it openly. Implicit signals were sent by other partners that they felt the public sector was not coordinating the programme but dictating to the other partners what work they should do, avoiding undertaking the necessary day-to-day coordinating work. One partner said:

> "Government feels that other partners work for them, not alongside them" (Respondent # 26, private sector actor, interviewed on 4 March 2009, verbatim).

The state partner (the MPPP representative) was also seen as lacking the necessary skills to be a leader (such as not having a clear vision of the future of the partnership), and not fully committed to the partnership (Respondent # 55, interviewed on 18 December 2008). In an attempt to improve this situation, the chairman of PEWOG stepped in to save the PPP and offered to lead the partnership. He believed that 'roles must follow the person, and not the office' (Respondent # 55, 18 December 2008). His offer, however, was turned down by the local authority (MPPP), and has resulted in him being summoned by the State Executive Council (EXCO) member to provide an explanation over the matter. In an interview, he expressed:

> "Many government officers are envious of the publicity that PEWOG is getting. My God….. I went to see the EXCO *[state executive council member]* and straighten things out. I have to explain to him that we are not after the publicity, but taking care of the environment is what we are after. Ridiculous!! Well that's the price that you have to pay for trying to make a partnership works." (Respondent # 55, NGO, interviewed on 18 December 2008, emphasis added in square bracket).

Several times during the interview, he kept stressing the need for the right leader to hold power and to guide the PPP in the right direction. The following excerpts from the interview transcripts clearly reflect his sentiments towards this matter:

> "The leader of a partnership is like the driver of a bus. Without a driver, how would the bus move?" (Respondent #55, NGO, interviewed on 18 December 2008, verbatim).

> "In a partnership, the people are important. It is the singer that counts not the song. The person can come from anywhere. Any representative from any partner stands the chance to lead the partnership, as long as the person is prepared to dedicate his time and has the leadership quality" (Respondent #55, NGO, interviewed on 18 December 2008, verbatim).

During separate interviews, clarification was sought over the matter of who leads the PPP and both representatives from the MPPP and from PEWOG claimed that they were the current leader – implying that the conflict was far from over! However a partnership meeting (on 3rd March 2009) was chaired by the representative of PEWOG and conducted at the MPPP's office, indicating that PEWOG had, at that time, taken over de facto leadership of the partnership.

In partnerships, all partners should work side by side by retaining their operational autonomy and not be commanded by other 'partners'. However, the presence of a responsible leader to coordinate the programme and oversee its day-to-day operation is needed. A valuable lesson learned from this case study is that a leader has to be appointed at the outset of a partnership programme. For a partnership to be effective, a list of prerequisite criteria for the leader should be prepared and agreed by all partners. A representative who fulfils or comes closest to fulfilling all the requirements deserves to be appointed as the leader at the commencement of the collaboration provided that she or he can gain the support of the majority of the representatives. This is essential to ensure that the leader is not manipulating the arrangement to meet his or her own ends (Darlow and Newby 1997). Kooiman (2003) suggests that delegation of responsibilities and authorities should be fairly expressed to all partners for a PPP to function successfully. As a process, a PPP is dynamic; especially with regard to participants, power structures and rules of the game. As such, the roles and responsibilities of partners should be restated each time change occurs. In this case study, power struggles among partners (especially among the two bodies representing state actors), was not contributing towards the stability of the PPP. It is very challenging for a non-stable partnership to be effective. The discussion now turns to a set of related issues concerning partner interactions, and the roles of effective communication, trust and commitment.

### 7.4.2 Conflicts between State and Non-state Actors

As discussed in the section above, the pressing problems which surfaced from interviews with actors in the two case study PPPs are not between the actors of governance and wider society, as one might have imagined, but between the actors of governance themselves. There are interaction-related issues among and between the partners. In PPPs, actors interact through negotiation that possibly combines hard-nosed bargaining with consensus-seeking deliberation

(Sørensen and Torfing 2009). In unstable PPPs where there is a lack of communication, trust and commitment among partners, consensus-making might be more problematic. The following discussion seeks to explore the impact of the lack of these vital elements in the case study PPPs.

***Recognition of Interdependency***

The state actors in the studied PPPs act as the coordinators of the programme and offer to provide venues and refreshments for related events and functions such as partner meetings, exhibitions, seminars, carnivals and expositions. They also assist, for example, in cutting through the red tape when it comes to approving permits to hang promotional banners, posters and bunting, and setting up collection centres for the partnerships (Respondent # 6, 16 December 2008). In both case studies, the partnerships depended on Dell to pay for the printing costs of promotional and publicity items such as banners, posters, pamphlets and t-shirts for volunteers. Dell also contributed prizes for competitions, contests and lucky draws which were conducted regularly by the partnerships to increase the visibility of the programme among the public. IRM Sdn. Bhd. – a company licensed by the DOE to manage e-waste – not only shared their knowledge and expertise in helping with the disposal of the e-waste, but also collected and transported the e-waste from all collection centres in Penang and PJ for free. Apart from that, IRM paid incentives to the participating public (in terms of cash in PJ and shopping vouchers in Penang) and provided a monthly allowance to the organizations who managed collection centres. Association with Sunshine Supermarkets (in Penang PPP only), CBOs and NGOs has widened the scope of this partnership in terms of the area of collection and target groups. The close links that CBOs and NGOs have established with the public were manipulated to persuade more people in society to participate in the programme. In this respect, state actors depended on non-state actors as allies in governing e-waste. Similarly, the non-state actors benefited from the partnership with state actors. Dell, IRM and Sunshine

Supermarkets utilized this partnership as a free advertising opportunity for their products and services, and a part of their corporate social responsibility (CSR) programme, while CSOs (NGOs and CBOs) maximized the opportunity to increase unity among community members and ensure proper disposal of unwanted computers. This partnership also provided an opportunity for IRM to access another source of raw material for its e-waste recycling industry as the amount of e-waste had reduced dramatically upon the implementation of Environmental Quality (Scheduled Wastes) Regulations 2005 (Respondent # 26, 4 March 2009) (see Chapter 5 – Section 5.2.3).

It is apparent that interdependence exists and is the backbone of these partnerships. Weighing all the resources pooled by all partners into these partnerships, and the benefits that they gained out of it, the state actors were gaining more than other partners. Although win-win situations do occur in these partnerships, the existence of asymmetrical power relations between state and non-state actors will tend to produce both winners and losers (Sørensen and Torfing 2009: 241). In a study by Bell and Hindmoor (2009), they suggest that where there is interdependency in a relationship between states and non-state actors, it is often asymmetrical where states gain more than the non-state partners.

Although interdependence between actors is very prominent in both case studies, the state actor in Penang (MPPP) refused to recognize that they depended on the contributions of other partners in ensuring that the partnership functioned effectively (based on interview with respondent # 6), and was still trapped in the traditional view that local authorities work in isolation from other actors. Based on this research, it would seem that the public sector in Malaysia fails to view the private sector and civil society groups as true 'partners', and there was no felt need among the government agencies to work with other partners. As one state actor explained:

> "This programme is straight forward. People send computers to recyclers and get money. Like we sell old newspapers. DELL can do this with their contractor, IRM, why do they need to include us. This is because they want to ride on us. But to MPPP, this programme is a huge burden." (Respondent # 7, Government, interviewed on 6 March 2009, verbatim).

These findings chime with the findings of Ahmed and Ali (2006) in a study of solid waste management in Bangladesh. A study by Ikiara et al. (2004) in Kenya also revealed that municipal officers do not see NGOs/CBOs as potential partners, where there was a prevailing negative attitude among government officials toward non-state initiatives.

The issues discussed above have significant implications. Recognition of interdependency is one of the key requirements to ensure a partnership can progress well (Stoker and Young 1993). Every partner should appreciate the contribution of other partners as they work in a team. Recognition from fellow partners will lift the morale of every partner and motivate them to work harder for the partnerships. Lack of recognition of interdependency from the government for the efforts of voluntary CBOs was also raised by a representative in PJ. He suggested that recognition should not only go to the organization but also the individual volunteers to lift their spirits and heighten their motivation (Respondent # 42, 27 February 2009). Lack of recognition of interdependency could create a sense of unequal treatment and frustration among partners that will, in turn, lead to a lack of support for the partnerships, which could eventually cause them to collapse. Ahmed and Ali (2006) found in their research that the success of a partnership is a function of support from the public sector, the private sector, citizens and also politicians.

***Lack of Communication, Trust and Commitment among Partners***

Good communication among partners is an important aspect to keep partners together. Communication between partners includes the exchange of information, planning and strategizing and sharing feedback on partnership activities with the other partners (Stoker and Young 1993, Waddock and Bannister 1991). The two most common communication methods in the case studies were face-to-face meetings and email exchanges. There is also a similar trend among the partnerships studied regarding the frequency of meetings. Face-to-face meetings were more frequent at the early stages of partnership formation, and reduced slightly afterwards as the partnerships became more stable. In the PJ case study, several meetings were conducted to discuss the formation of the partnership but thereafter there were no more meetings between the partners after the partnership commenced.

Lack of face-to-face meetings in the PJ case study was due to logistical and cost issues as two of the partners were based in Penang. However, partners were kept informed and updated with the progress of the partnerships via e-mail communications. This is important to ensure that interest is not lost and fades with time. Miscommunication or lack of communication will have a toll on the progress of a partnership. For example, in the Penang case study, MPPP and PEWOG both disapproved of the idea of a grand launching of the partnership, yet accused each other as being the promoter of the idea. This issue should not arise if parties communicate and discuss the matter openly. Miscommunication among partners also resulted in a group of MPPP enforcement officers taking down a banner of the computer recycling programme which was hung near a collection centre operated by a CBO in Penang.

Goodwill and trust are important elements in partnerships. Successful partnerships often grow incrementally and evolve based on establishment of

trust (Slater et.al. 2007, Waddock and Bannister 1991). In the Penang case study, the CBOs were entrusted with pre-signed voucher booklets, which could easily have been misused without trust. The strains in the relationship of MPPP and PEWOG could be due to lack of trust. Lack of trust between partners made the MPPP representative sceptical of any decision agreed by the partnership, and this lead to misinterpretation and misconception that could have endangered trust. Lack of trust among partners might lead to lack of commitment of partners towards the partnership. In their work on partnership, Darlow and Newby (1997) found that the management of partnerships is time consuming and unrewarding at the early stages, and therefore needs a high level of commitment from all partners. Hudson and Hardy (2002) claim that partnership is more likely to be sustained with ongoing commitment from the most senior levels of the partner organizations, whilst also acknowledging the importance of linking middle level management with operations. In the partnerships studied, the CBOs have shown an impressive level of commitment to the partnerships. However, several representatives from CBOs, have expressed their dissatisfaction regarding the level of commitment from other partners. Representatives from CBOs felt that both the public sector partner and the private sector partner were less committed to the partnership compared to the CSOs.

### 7.4.3 The Issues of Interaction and their Impact on the Operation of PPPs

Issues related to the interaction of actors such as power struggles, lack of recognition of interdependency and lack of bonding among partners discussed above have the potential to destabilise a partnership. Unstable partnerships may de-motivate partners and decrease interest to commit to the success of the programme. According to Roberts (2000), PPPs allow the public sector to achieve both effectiveness (when partners strive to pursue common objectives) and efficiency (when partners cooperate through common means) in service

provision to the public. If cooperation and strong bonding among partners cannot be achieved, it is highly unlikely that effectiveness and efficiency through PPPs can be achieved. For a PPP to be effective and efficient, its foundation - built on tight cooperation - must be strong and stable. It is challenging to persuade wider society to participate in a programme when the partners of the programme themselves do not trust each other, and this will likely have a significant effect on the performance of a PPP.

The problems that surfaced in the PPPs in the case studies were partly rooted in differences in the work culture of the state and non-state actors. The different work cultures among the state and non-state actors led to misunderstandings and conflicts among actors which threatened to paralyse the PPP. Many government staff in the PPPs studied were not ready to accept the new concept of governance in PPPs where participants from outside of the traditional government structure are involved in the governance process. The public sector partners were perceived by the other partners as passive partners who were still gripped by an old management style that prevented any improvement from the traditional path of isolation from the private sector and the wider community. This might affect the performance of the PPP as, according to March and Olsen (1995), the ability of partners to adjust to change is one of the factors that contributed to the effectiveness of PPPs. State actors were also perceived by other actors in the case studies as being less dedicated and committed in their work. A respondent vented his frustration towards the state actors in one PPP during an interview session:

> "Government officers work from 9 to 5, while NGO and CBO work from 5 to 9. They are working in different time zone, and never the two could cooperate. You try and call the government officer to work on Sundays or call for a meeting in the evening after office hours and you'll understand what I've just meant. And that is why NGO succeeded when others fail. Because they work wholeheartedly and

dedicate their time and effort to the programme." (Respondent # 55, NGO, interviewed on 18 December 2008, verbatim).

Lack of commitment towards the PPP among partners could be due to the lack of a formal agreement and the absence of formal documentation. In Bangladesh, the introduction of a formal instrument in the form of a memorandum of understanding signed by the partners worked well in solid waste management in the town of Khulna (Ahmed and Ali 2006). As this would formalise the concept of partnership, it could make partners more committed to the programme.

## 7.5 Lack of Democracy and the Dominant Role of the State Actors in PPP

PPPs, like other co-governance modes is claimed by governance proponents and advocates as being more democratic than the hierarchical mode of governance as it offers an opportunity for civil society to take part in the governing process (Smismans 2006). By facilitating political participation of non-state actors, PPPs help to widen the scope for inter-discursive contestation and deliberation (Dryzek 2000). However, according to Sørensen and Torfing (2009), the positive contribution of PPPs to the democratic functioning of society can only be fully appreciated if PPPs themselves are democratic. A PPP is deemed to be democratic if the setting up process and its operation are done based on equal opportunity to all potential partners. The following discussion addresses this question based on the analysis of the two case studies.

The first e-waste management PPP in Malaysia was founded by the Municipal Council of Penang Island (MPPP). It serves as a means to achieve two aims; to overcome the problems regarding management of collection, transport, storage and disposal of waste computers generated by household users and to promote

public participation in decision making (to fulfil the commitment of LA 21 arrangement) (Respondent # 55, 18 December 2008). To achieve these objectives, the state actor offers selected non-state actors an opportunity to be involved in governing action along with them in persuading society to dispose of e-waste responsibly. The first offer for cooperation was sent to Dell, due to its experience and expertise (Respondent # 55, 18 December 2008). At the time the offer was made (around 2004), Dell already had an online e-waste recycling programme which it ran (and continues to do so) in collaboration with its e-waste contractor. Normally, at any one time, there are several e-waste contractors working with Dell. Dell is given the right to bring in any one of its e-waste contractors as partners of the PPP. The current contractor (IRM) is the third company chosen by Dell after the contracts with two earlier companies were terminated due to poor performance (Respondent # 55, 18 December 2008). Two things are apparent in this process; firstly, the lack of democracy in selecting the PSA partner by the PPP proponent (MPPP) as Dell is offered the opportunity and not elected; and secondly, there is also clear evidence of lack of democracy where the PSA (Dell) is given the freedom to choose another PSA (e-waste contractor) to be a partner of the PPP. This indicates that there is no equal opportunity among the potential PSAs to participate in the PPP. According to Sørensen and Torfing (2009), this is common in cases where PPPs are formed as part of a deliberate political strategy and where the primary motive is to enhance the effectiveness of governance, and not to increase participation. In such cases, the assumed democratic credentials of PPPs are not met. However, from the respect of the effectiveness of a partnership, this might not necessarily be negative. In fact it might bring a desirable impact (Sørensen and Torfing 2009). According to Sørensen and Torfing (2009), a partnership which consists of close knit and like-minded actors, who know each other well, might be more effective in its operation as all actors are comfortable with each other, compared to a more democratic partnership with less positive coordination among actors.

The decision to select the partners from among the CSOs was also done by the state actors. In both the cases of the PPPs in Penang and in PJ, participants from the CSOs were chosen based on their experience in organising recycling programmes (Respondent # 55, 18 December 2008; Respondent # 8, 26 November 2008). However a random counter check with CBOs in PJ revealed that two CBOs that run recycling programmes did not receive any invitation to join the PPP as claimed by the state actors (Respondent # 45, 1 April 2009; Respondents # 46, 2 April 2009). This is another indication that non-state actors did not receive equal opportunity to participate in these PPPs; a contrast to what PPPs are normally praised for – namely, their democratic functioning. In these two cases, democratic control and accountability was weak due to the fact that partners were not elected or selected through open competition, but rather were appointed.

The impact of the undemocratic process of selecting partners to the overall effectiveness of the partnership in the case studies was not explicitly studied. However, the undemocratic nature of the partner selection process could cause dissatisfaction among the potential partners which were not selected. Although these groups were not part of the PPP and therefore did not affect the operation of the PPPs concerned directly, their sense of dissatisfaction could spread to society and thus reduced the participation rate and the performance of the PPP.

The undemocratic nature of the PPPs was also prevalent in their operation. The roles of different partners was not discussed and agreed among partners, but rather determined by the state actors, who acted as the coordinators of the PPPs (Respondent # 6, 16 December 2008; Respondent # 8, 26 November 2008). This resulted in a prominent and dominant role for the state actors (as the coordinator of the programme) compared to the roles of other actors. There was also the common perception among the CBOs that certain partners (especially PSAs) were considered as more privileged partners in the PPP by the state actors, as indicated by one respondent:

> "We are just small partner…not like Dell. If we don't take part also, the partnership won't die *one*…" (Respondent # 37, CBO, interviewed on 1 March 2009, verbatim).

According to the state actors, most decision making meetings of the PPP were only attended by the state actors and the PSA (Respondent # 6, 16 December 2008; Respondent # 8, 26 November 2008). This was reinforced in the partners' meeting (of PPP Penang) which I attended on 3rd March 2009. The outputs of the meetings and any related information were conveyed to the leader of the CBOs by the representatives from the state - the officer from the local government in PJ and PEWOG in Penang (Respondent # 55, 18 December 2008; Respondent # 8, 26 November 2008).

## 7.6 Conclusion

PPPs in e-waste management in the case studies in Penang and PJ are examples of how partnerships were used as an available governing option to address an environmental issue where policy was absent and the government was not capable of handling the issue alone. This chapter contributes to the understanding of how governance works in managing e-waste at the local level in Malaysia via providing facilities for society to dispose of its e-waste responsibly. The operation of PPPs in the case studies were influenced by other factors such as the lack of bonding among actors, internal crises relating to power struggles over PPP leadership, lack of recognition of interdependencies and refusal to change on the part of the actors. Rather than consensus and cooperation, differences in perspective among partners instead led to strain and tension especially between MPPP and PEWOG in the Penang case study. Darlow and Newby (1997) suggest two ways to avoid a partnership from wallowing in indecision and inactivity due to strains and tensions among actors. Firstly, by balancing inequality between partners; and secondly, by

actively managing leadership crises. These are, of course, not easy to achieve. For the state actors this would mean opening up to the idea of working together and giving equal treatment to the private sector and the wider public in building a more consensual way of working. The analysis has shown that pooling of resources from different partners has contributed to the many advantages and benefits received by partners, and was the primary motive for setting up partnerships in the case studies. However, the benefits gained by partners were not equal, with the state actors gaining the most out of the partnerships despite their lack of contribution towards their operation.

These two case studies of PPPs in Penang and PJ have shown that the roles of state actors in both PPPs are very dominant. The state can choose the partners, dominate and set the agenda, and hold central positions as programme coordinators. Non-state actors' roles in both the case study PPPs are as governing allies to state actors in providing facilities for the public to dispose of e-waste responsibly and to persuade the public to participate in the programme through sharing of information and paying out incentives. State actors were still playing the pivotal role in the governance process although PPPs involve multiple actors. It was apparent that the state was not hollowed out in the PPPs studied; instead its roles were reinforced and extended with the help of non-state actors. Moreover (as far as the operation of the PPPs is concerned), state actors gained more benefit from the PPPs compared to other actors although they were not the greatest contributors to the pool of resources.

Contrary to the popular belief that PPPs are a way to increase democracy in the governing process, these two case studies in Penang and PJ have proved to be otherwise. The case studies show that there is lack of democracy both in the process of initiating the PPP and in its subsequent operation. Besides being an undemocratic governing process, PPPs in both case studies also demonstrated the dominant role of state actors over non-state actor in the co-governance process. State actors were playing the pivotal roles in decision making and were definitely not hollowed out in this mode of governing as suggested by

many new governance advocates (see Section 3.3). Notwithstanding these tensions and deficiencies, it is worth ending by highlighting that PPPs, although they have not been fully successful in governing e-waste in Malaysia, have been successful in providing facilities for society to dispose of their used e-waste responsibly.

# Chapter 8: Conclusions

## 8.1 Introduction

The transformation of Malaysia's economic and social landscape due to the progressive shift from an agricultural-based to an industrial-based economy dating from the early 1980s, has triggered the growth of a new and significant environmental 'crisis' in the country (Khoo and Rau 2009, Sonnenfeld and Mol 2006). At about the same time, the rise of neoliberalism at a global level resulted in the increasing involvement of NGOs and PSAs in decision making and society steering processes (De Angelis 2003). The combination of these two processes has led to the penetration of new actors into the governing process, thus germinating increasingly complex governance arrangements where the authority to govern does not rely exclusively on the authority, legitimacy and sanctions of governments (Hysing 2009, De Angelis 2003).

The shift from government to governance, distinguishable by the presence of a multiplicity of levels, actors and modes of governance, is apparent in the environmental domain in Malaysia. A central aim of this research was to explore the emergence of governance with regard to one aspect of the environment in Malaysia - e-waste - which is not only a local concern, but also resonates with global level concerns, actors and interests. More particularly, the aim of the research was to investigate the roles, significance and implications of state and non-state actors in environmental governance in Malaysia. From this core research aim, five research questions emanate. The first research question relates to the need to identify the multiple actors of e-waste governance. This is followed by the second research question which concerns the deeper investigation of how and why these actors are involved in e-waste governance, and the implications of their involvement. The third research question pertains to the roles and modes of e-waste governance by various actors, and their respective significance. The fourth research question

deals with a specific type of co-governance mode - Public Private Partnerships or PPPs. And finally, the fifth research question tries to determine the dominant and significant mode of e-waste governance in Malaysia, and the consequent implications of this restructuring of governance. A qualitative methodology, using case studies, was adopted to explore these research questions, utilizing a combination of three methods – interviews, observation and the review of documents – to collect data, which were then analysed thematically.

This final chapter of the thesis will return to the research questions set out in Chapter 1 and summarised above, to reflect on the extent to which the aims of the research have been met. This is done by reflecting on the empirical evidence (presented in Chapters 5, 6 and 7), and integrating this evidence with the work of other scholars working in other country contexts (Chapter 3). The section which follows (Section 8.2) seeks to reflect on the first three research questions. In this section, the actors of governance are identified, and the concept of multiplicity in governance is elaborated and deliberated.

Section 8.3 focuses on the involvement of state and non-state actors in a specific type of co-governance mode – PPP – summarizing the reasons for their involvement, and using this to make comparisons with the experience of other countries. This comparison will then lead to a wider consideration of the application and nature of co-governance to countries like Malaysia. In the following section (Section 8.4), the relative dominance and significance of the different modes of governance will be highlighted and explored, leading to a contemplation of the theoretical and empirical limitations in Section 8.5. This is followed by a discussion of the policy relevance of the research findings in Section 8.6, policy reflections and recommendations in Section 8.7, before finally ending it with a conclusion in Section 8.8.

## 8.2 Reflections on Multiplicity in E-waste Governance

Evidence from this study has shown that there is multiplicity in e-waste governance in Malaysia in terms of levels, actors (and their roles) and modes. This sub-section will discuss this issue, thus addressing the first three research questions set out in the opening chapter.

### 8.2.1 The Multiple Actors of E-waste Governance and the Reasons for their Involvement

The first research question focused on the identification of the actors in e-waste governance. Empirical evidence from this research has shown that a multiplicity of actors is involved in e-waste governance in Malaysia (see Chapter 5, Chapter 6 and Chapter 7). This echoes research undertaken in other countries, such as the USA, China and Switzerland (see Section 3.5.3), demonstrating that one of the characteristics of governance, namely the multispheres of governance (Betsill and Bulkeley 2006) or Type II Multilevel governance (Hooghe and Marks 2003) – marked by the involvement of multiple actors - is present in e-waste governance in Malaysia.

The multiple actors involved in e-waste governance in Malaysia are categorised into two broad groups: state actors (the government) and non-state actors (CSOs and PSAs); while CSOs are further divided into NGOs and CBOs (see Section 4.3.1 and Figure 4.3). As there is no standard definition for the term 'non-state actors' (Schwartz 2004), it is used in this thesis to refer to actors in the governance process who are independent of the state and legally registered. However, evidence from this study clearly shows the problems connected with such a definition: simply put, some of the non-state actors are not totally independent from the government. These include GONGOs (government operated NGOs) such as PEWOG and SERI, and GLCs (government-linked companies) such as Kualiti Alam and Alam Flora which are involved in waste management services. These examples show that the

state exerts its presence, or casts a shadow over, so-styled non-state actors of governance in Malaysia. Developing this point further, it also indicates that there is lack of democracy in the way the governance concept has been adopted and applied in Malaysia. Democracy (through inclusion) is one of the underlying expectations connected with 'new' governance (see Trubek and Trubek 2005), and yet in Malaysia there are strong reasons to question the presence of such a democratisation process.

One aspect of governance which needs further clarification, and which links to research question two, concerns the reasons for the involvement of these actors in governance. The empirical evidence collected has shown that the reasons differ significantly among each group of actors. A key reason for the involvement of state actors is their sense of responsibility to external pressures (which are discussed in detail in Chapter 5). Malaysia's first step to adopt the hierarchical mode of governance in 1996 was taken out of its responsibilities as a party to the Basel Convention. Other countries such as China (Zhang 2009, Yang 2008) and India (Bandyopadhyay 2008, Mohan 2008) took such action for similar reason. This shows that while the authority to govern may remain state-centred (and even that is becoming more diffuse), the initiative and momentum for change now emanates from international fora and agreements on the one hand, and from local level and community pressures on the other. This condition has been termed multiple tiers of governance by Betsill and Bulkeley (2006) or Type I Multilevel governance by Hooghe and Marks (2003), and is another characteristic of governance.

Another set of legal instruments with such capacity (the trickle down of authority) is the EU directives, which has been found to be a factor shaping solid waste management law in the UK (Bulkeley et al. 2007) and Ireland (Davies 2008). Two of the EU directives on e-waste (WEEE and RoHS – see Section 3.5.1) have had significant, albeit indirect effects on Malaysian e-waste policy and control, for two reasons. Firstly, WEEE and RoHS are influencing

the formulation of law on e-waste control in EU countries, and this is then filtering through to shape Malaysian policy. The widespread application of the EPR principle, as one of the requirements under WEEE, requires producers to take-back their end-of-life products. Malaysia, in its attempt to improve the regulation of e-waste, is learning from the experience (and tools) used in the EU, thus explaining the currently on-going (as of December 2010) drafting of an EPR-based law. Secondly, one of the targets of WEEE and RoHS is the manufacturing sector. Many international manufacturers (which are operating in Malaysia) design and produce products for the global market; as a result, strict internal policies on e-waste control are formulated as a way of self-governing their own waste. Many of these companies are 'ahead' of Malaysia in terms of the requirements of currently active regulations.

The involvement of state actors in e-waste governance is Malaysia is also due to the pressure from domestic NGOs (such as CAP and SAM), and external pressure from international NGOs such as BAN). Zhang (2009) has reported much the same set of pressures operating in China, where pressure from other countries as well as from international NGOs have encouraged the Chinese government to restructure the operation of e-waste dismantling activities in the country. This thesis has suggested that the involvement of non-state actors in e-waste governance is driven by three factors: first of all, lack of or ineffective traditional hierarchical governance by state actors; second, inspiration drawn from the experience of like-minded bodies (in the case of NGOs and CBOs) or overseas offices (in the case of private sector actors) in other countries; and third, current e-waste governance trends in the Global North (which is built on a combination of several factors such as the introduction of EU Directives [WEEE and RoHS], the proliferation of the EPR principle and the increasing interest in Corporate Social Responsibility [CSR]). Taken together, then, we see in Malaysia the shaping of an e-waste policy environment which in no small way is linked to international-level processes, whether in the private

sector, among NGOs, or in evolving national and regional (EU) legal frameworks.

### 8.2.2 The Roles of Actors in Multiple Modes of E-waste Governing

The remaining parts of this section will seek to illuminate research questions two and three, regarding the roles of actors and modes of governance. It is impossible to discuss this two elements of governance (roles of actors and modes of governance) in isolation from each other as actors behave differently (and play different roles) according to the mode of governance. Based on the empirical evidence collected, e-waste in Malaysia is governed through multiple modes; the conventional hierarchical modes, and the 'new' non-hierarchical modes (such as persuasion, self-governance and co-governance). Although all actors are involved in all modes of governance mentioned, the roles of state actors are more prominent in the hierarchical modes, while the roles on non-state actors are more significant in the non-hierarchical modes. This is another manifestation of multiplicity in governance, which is a characteristic of governance.

The findings of this research demonstrate two significant characteristics of governance modes in Malaysian e-waste: firstly, that the modes of governance are not mutually exclusive, but share some overlapping criteria or characteristics, and hence are not distinctly different from one another. Furthermore, we can view governance from a number of perspectives; one particular governing approach might have multiple categorization modes depending on the perspective used. Secondly, the modes of governance often co-exist, so that multiple modes of governance are in operation simultaneously.

State actors in e-waste governance in Malaysia are involved in three governing modes, namely hierarchical, persuasion and co-governance, where its involvement in the hierarchical mode is the most significant. It is in the hierarchical mode where state actors formulate and enforce law. Evidence from

this study shows that the hierarchical mode of controlling e-waste has been only partially effective, for two main reasons; first, because of loopholes in the statutes and second due to lack of (or ineffective) enforcement (see Section 5.2.2). Similar limitations are reported to be evident in the performance of hierarchical mode of governance by the Chinese government (Zhang 2009, Yang 2008). In both countries, limited results and the many restrictions in governing e-waste via the hierarchical mode have led to the two things; first, the intervention of non-state actors and second, the application of other modes of governance by the state actors.

Another governing mode that state actors in Malaysia are involved in is the persuasion mode (where its main role is as the enabler). As reported in Section 5.3, this has had limited success due to lack of staff, funding, publicity and awareness among wider society. However, Davies (2008) has shown through her study on governance of waste management in New Zealand (through 'Reduce Your Rubbish' campaign in 2003) that such an approach can be highly effective. This infers that the persuasion mode of governance by state actors can succeed if all the limitations are overcome; and is done continuously instead of as a one-off event (Davies 2008).

In responding to questions about the factors that limit their ability to play their roles effectively in both hierarchical and persuasion modes of governance, many state actor respondents pointed to insufficient staff as the main reason. How far this is true is hard to measure, but one significant weakness relating to government staff is a lack of cooperation between state entities and communication breakdown among government staff at all levels.

On the other hand, PSAs are involved in four modes of e-waste governance in Malaysia (hierarchy, persuasion, self-governance and co-governance), but in contrast to state actors it is in the self-governance mode where their role is the most significant. E-waste which is governed by PSAs, includes that generated

by the PSAs (in their operation) and also the end-of-life products of consumers. PSAs' capability in self-governing has helped to facilitate the public to practice responsible disposal of e-waste in the absence of effective hierarchical control (and associated facilities) from the government, and thus, in turn, has supported state actors in carrying out their responsibilites. PSAs in other country have also shown similar capacities such as Dell in the USA (Wood and Schneider 2006). However, Dell USA's commitment in self-governing of e-waste expanded further to include phasing out the use of certain hazardous substances in electrical and electronic equipment such as Brominated Flame Retardants (BFRs) and Polyvinyl Chloride (PVCs). Judging from the evidence in cases in Malaysia, coupled with the experience of the USA (as mentioned above), self-governance mode by PSAs has the potential to fill the void in e-waste governance which exists due to government failure. Other than self-governance, the role of PSAs in hierarchical mode of governance is becoming relatively stronger in Malaysia, which is reflected in the process of drafting of a new law (on collection and recycling of household e-waste based on EPR principle) where PSAs have been (and are being) consulted by the DOE (see Section 5.2.3). Even though sceptics see this as a way to transfer the burden and responsibility of managing e-waste to the PSAs (from the state-actors), rather than a move to share power and authority, it nonetheless illustrates the way in which PSAs' are being drawn more fully into the hierarchical governance mode. (PSAs' role in co-governance mode is discussed in Section 8.3.)

CSOs have also been active in e-waste governance, and their significant contributions are through the persuasion mode and hierarchical mode (through lobbying). In governing through persuasion mode, the main target of CSOs is the wider society. The lobbying approach has been used by CSOs to influence state actors in decision making; such as the lobbying carried out by CAP and SAM which contributed (along with other factors) to the formulation of Malaysia's first law on e-waste control (Environmental Quality (Scheduled Wastes) Regulation 2005 – see Section 5.2.1). However, lack of democracy in

the landscape of Malaysian politics, which is characteristic of other Asian countries such as China (see Martens 2006 and Schwartz 2004, Section 3.4.2) has made this action more daunting compared to the action of CSOs in western countries (more economically developed countries). CSOs' persuasion actions which are targeted to the general public and PSAs have not shown any positive outcome thus far. There are two prominent differences with how CSOs in more economically developed countries work, compared to CSOs in Malaysia. Firstly, many CSOs in the more economically developed countries (which are fighting for the same issue) work together in networks to increase their influence; two such networks are the 'e-waste network' (founded in late 1990s) and Computer Take-Back Campaign (CTBC – founded in 2001). CSOs in Malaysia, by contrast, commonly work individually. Secondly, many CSOs in the more economically developed countries have altered their tactics in persuasion mode of governance (particularly the lobbying approach) by targeting corporations/PSAs instead of state actors, as they feel that getting large corporations to change their policies can often be easier than changing government policies (Vogel 2005).

The reflections above demonstrate that multiple actors are involved in e-waste governance in Malaysia, where each plays their own roles (based on individual capacities and abilities) in multiple governing modes. However, every actor has established a more prominent role in one particular mode (although while being involved in multiple modes of governing). Empirical evidence from this study has shown that the roles of state actors are most significant in the hierarchical mode of governance, the PSAs' roles are dominant in self-governing, while the roles of CSOs are most prominent in the persuasion mode of governance. This pattern has emerged because each actor has different abilities; for example, state actors have the power and authority, therefore excel in the hierarchical mode compared to other modes; the PSAs have money and expertise – which has given them the edge to self-govern their own e-waste; while the CSOs have close links to penetrate society, and the

persistence to pursue the PSAs and state actors. Logically, a governing mode which is built upon the different strengths of each actor should create a 'perfect' governing complex; is this so in practice? This chapter now turns to reflect on this matter.

## 8.3 Reflections on PPP as a Mode of E-waste Governance

PPP is a mode of governing (a sub-set of the co-governance mode), where its distinctive characteristic compared to other modes is that it operates on the basis of the pooled abilities of different actors. It has been adopted as a mode of waste governance in both less economically developed countries (Global South) (see for example Ahmed and Ali 2006 and 2004), and Forsyth 2006 and 2005) and in more economically developed countries (Global North) (see Wagner 2009, Deathe et al. 2008, Renckens 2008, Slater et al. 2007, Binica and Bressers 2004).

There are different reasons why PPPs have been used as a governing mode; these include to provide services (or to improve available services), to solve issues related to waste management (and thus to strengthen local government), and to include (or increase) public participation in the decision making process (and thus increase democracy), or some or all of these. The reasons for the establishment of PPPs in Malaysia (based on the two cases studied in Penang and PJ) are split between the state and non-state actors. Interview evidence shows that non-state actors are of the opinion that PPPs are established due to the inability of government to handle the issue of e-waste alone. They are thus seen by the non-state actors as a way to improve services and to address government failure. State actors, on the other hand, view PPPs as another tripartite project under LA 21 (one of the objective of LA 21 is to increase democracy through participation).

There are many success stories of PPPs in waste management. For example, Ahmed and Ali (2006) found that PPPs in Bangladesh have increased the quality of solid waste disposal services; Wagner (2009) discovered that the adoption of a PPP in Maine, USA successfully diverted e-waste from landfill and from being exported; while Deathe et al. (2008) uncovered a similar finding in Canada. In Malaysia, PPPs have provided facilities for proper disposal of e-waste. However, evidence presented in this thesis shows that there are several weaknesses in PPPs in Malaysia. Among the main weaknesses identified are lack of bonding among actors, internal crises relating to power struggles over PPP leadership, a lack of recognition of the interdependencies between actors (particularly on the part of state actors), and a refusal to change on the part of some of the actors (see Section 7.4).

### 8.3.1 The Implications of PPPs to E-waste Governance

According to Trubek and Trubek (2005), governance is expected to increase democracy and legitimacy in the decision making process through the involvement of non-state actors. Renckens (2008), who explores PPP in the USA, discovered that partnership is a practical approach to governing e-waste due to its ability to move a conflict stance to a constructive dialogue, and to increase the legitimacy and democracy of the PPP by the participation of multiple stakeholders. However, the case studies presented in this thesis have shown that there is lack of democracy in PPPs in Malaysia; both in the process of initiating them and in their subsequent operation, and thus inclusion of non-state actors in PPP cannot be seen as a cure for a democratic 'deficit'. This conclusion resonates with the work of several scholars such as Bell et al. (2010), Bell and Hindmoor (2009), Steffek and Smismans (2008), and Smismans (2006). Evidence presented in this study shows that PPPs are not 'co-owned', but rather dominated by government, and actors in the PPPs are not elected but selected by the dominant state actors.

This finding is similar to Forsyth's (2006) in his work on waste-to-energy projects in India and the Philippines. He found that PPPs are not a cure for a democratic deficit in decision making. Instead, he found evidence of a lack of democracy, legitimacy and accountability in PPPs in both countries due to the political environment in the two countries where open access to political debate by actors is restricted, and where PPP's participants are chosen (not elected) by the most powerful partner. This not only means that PPPs lack a democratic ethos but sometimes the participants are selected not based on their abilities but based on whether they can provide support to the most powerful partner. These factors (which are very similar to the Malaysian examples discussed here), besides indicating a lack of democracy, also imply a lack of legitimacy and accountability in decision making. To take this one step further, this reinforces that public participation and inclusion in decision making does not necessarily mean that this is part of a democratic process (Smismans 2006).

Besides being part of an undemocratic governing process, PPPs in both case studies also demonstrated the dominant role of state actors over non-state actor in the co-governance process. State actors played the pivotal roles in decision making (as argued by Bell et al. 2010, and Bell and Hindmoor 2009) and were definitely not hollowed out in this mode of governing as suggested by many governance advocates (such as Macleod and Goodwin 1999, Rhodes 1997, and Jessop 1994).

The involvement of non-state actors in governance (through PPPs and other modes) shows that the reliance on state actors in governance is not exclusive (Karkkainen 2004), and may not be as predominant as before (Rosenau and Durfee 1999). Evidence from this study suggests that the state is undergoing a transformation (rather than a decline in state authority) with the presence of non-state actors alongside them in the governing process. This resonates with the view of Bell et al (2010), Davies (2008) and Pierre (2000). Davies (2008) sees this trend as part of a strategy to renegotiate the power and authority of the

state while devolving responsibilities to other actors. Similarly, Bell et al. (2010) view the relationship between state and non-state actors in governance as having enhanced the state's capacity, instead of emasculating it. This is true in the case of two PPPs studied in this research, where interdependency among state and non-state actors has resulted in the introduction of a new service (collection of e-waste in exchange for cash/shopping voucher as an incentive) that has never been provided by the local government before.

## 8.4 Relative Dominance and Significance of Modes of E-waste Governance

Deliberation and comparison of all the four modes (hierarchy, persuasion, self-governance and co-governance modes) involved in e-waste governance in Malaysia have shown that each mode has unique strengths and weaknesses. Therefore, in this study no one mode can be distilled out as the most dominant, significant and effective. Dominance and significance in this context are assessed based on their impact on e-waste control. However, a relatively more prominent mode in term of impact is the hierarchical mode by state actors, through the formulation and enforcement of Environmental Quality (Scheduled Wastes) Regulation 2005 which came into force on 15$^{th}$ August 2005, even though – as deliberated in Chapter 5 – the regulation's effectiveness is restricted due to loopholes in the law itself and in its subsequent enforcement. Arguably, as a young nation (Malaysia secured independence from British rule in 1957), Malaysian society responded better to command-and-control tools of governance, than to campaigns of voluntary action. Not only in the issue of e-waste management as discussed in this thesis but also in other environmental issues such as open burning, most people adapt and change their actions and behaviours in response to sanctions and not out of environmental awareness and concerns. However, the hierarchical tool in this case (the way it was formulated) is only applicable to e-waste generated from industrial sources, hence leaving household e-waste outside the ambit of hierarchical control.

PPP (a sub-set of co-governance mode) is another dominant and significant mode of e-waste governance when compared to other modes, especially in governance of households' e-waste. Its strength lies in the combination of resources from different actors (which are unique and complement each other), into the PPP. PPPs in Penang and PJ, Selangor have successfully provided facilities for proper disposal of e-waste (particularly computers and peripheral equipment), reducing the possibilities of such waste being disposed of together with normal household waste and ending up in landfill. This action has not only diverted the route of e-waste to landfill, but it has halted it from being exported and thereby prevented e-waste from causing detrimental effects to the people and environment of other countries. However, as discussed in Chapter 7, the effectiveness of this mode is hindered by state actors, who are not ready fully to open up to this new way of working, in tandem with other actors. The thesis has shown that many state actors are reluctant to change their working style, and demonstrate a lack of enthusiasm and readiness to share power and authority with the other partners. This reduces the motivation of other partners and the momentum of the PPP. The PPPs in the case studies are also facing challenges from informal 'door-to-door' e-waste buyers who pay higher prices to the consumer (the public). If these problems can be countered, PPPs may become the best mode to manage e-waste from household sources.

## 8.5 Limitations of the Research

Although this research has produced a detailed account of the roles of multiple actors of governance based on the governance concept, there are limitations, in both the methodological and theoretical aspects of the work, which should be acknowledged.

Qualitative research methods were applied to this research, using interviews as the main data collection method. There were two main limitations with

applying this method in the research; firstly, there were difficulties related to getting consent from key actors to be respondents for this study. Most difficult was getting cooperation from PSA actors, where requests were either rejected outright or approved after a very long wait. Therefore, to overcome the problem, the strategy was changed, and much data was gained from information available in the public domain such as PSAs' websites. Another methodological concern was that several interviews (or parts of interviews) were conducted in another language (Malay language) or a mix of Malay language and English, while the thesis is written in English. The task of translating Malay into English, or a mixture of Malay and English into English may have resulted in a loss of meaning or led to unwarranted emphasis, reducing the precision of the material presented.

Apart from these methodological limitations, which were addressed as best as possible at the time, the governance concept applied in this thesis has not been able to provide detailed explanation of the impacts and consequences of e-waste governance (through multiple modes) to the minor actors of governance. For example, there is lack of information on the role and significance of informal e-waste recycling and re-cyclers. Questions such as what drives such recyclers into the business, whether they are aware of the consequent health hazards that they are facing, and do they know the effects of their actions on the environment and other people, would have enriched and enhanced this thesis. As such, a deeper analysis using ethnographic methods of such informal actors would have illuminated the socio-ecological consequences of such activities, widening the analysis into spheres of environmental and social justice.

As Malaysia is currently working on a new law (which is based on the EPR concept) and is learning from the experience of other countries, a study from another angle and perspective, such as looking into how does policy diffusion occur in the Malaysian context would have usefully complemented the

material presented here. Policy diffusion by learning (where actors learn from policy examples from abroad and draw lessons from such examples for their own jurisdiction) has the potential to reduce the cost and uncertainties when it comes to shaping and implementing policy. A detailed examination of the roles of state and non-state actors in policy diffusion processes would have complemented the findings of this research and contributed to a more comprehensive outcome.

## 8.6 Research Findings: Policy Relevance and Recommendations

The findings of this research indicate that available policy on e-waste governance in Malaysia has neglected to take account of e-waste generated by households, and instead focused only on industrial e-waste. From this, it is possible to infer that state actors are more concerned with controlling e-waste from being exported out of Malaysia, than managing e-waste being generated from other sources within the country (which may be leaching in the landfill or being treated illegally by informal recyclers). Another significant finding of the research is that a law is only effective if it is complemented by strict enforcement. Based on this understanding, coupled with the findings on the relative relevance and dominance of governance modes, a conclusion can be made that a new policy (or more effective implementation of the existing policy) which includes household e-waste control, and implemented using the PPP mode could be helpful in the current e-waste landscape in Malaysia.

Although more improvement actions are needed to iron out creases in the governance of industrial-generated e-waste, more immediate attention must be given to governing household-generated e-waste. A policy strategy which is able to divert e-waste from its route to landfill disposal or halt it from being exported, and which at the same time ensures that the collected e-waste (which is being ‘rescued’ from landfill or from being exported) is treated in an environmentally sound manner should be considered by governance actors in

Malaysia. Establishment of licensed collection centres which are run by non-state actors (informal actors such as scavengers and illegal scrap dealers could be employed as workers at such centres) should be considered. Also recommended here is the use of redeemable certificates upon purchasing of any electrical and electronic equipment, where the certificate is produced at the point of purchase for a fee and is redeemable once the item is returned to a licensed collection centre. This would serve two purposes; firstly, it would prevent people from selling stolen goods at e-waste collection centres, and secondly, it would encourage people to send their e-waste to registered and licensed collection centres.

The role of state actors is particularly relevant and significant considering the current political, social and economic landscape of Malaysia. Three factors that make state actors' role highly relevant in the Malaysian context are: firstly, only state actors have the power to exercise authority and formulate legitimate law; secondly, state actors through the hierarchical mode of governance may impose sanctions for non-conformers (and Malaysian society responds better to sanctions than voluntary calls); and finally, the use of the hierarchical mode by state actors will send a signal to society that the issue is serious and the government is determined to tackle the problem. However, the research findings also indicate that the Malaysian government is facing a number of obstacles in managing the process of e-waste collection, transportation and treatment due to a lack of human (including expertise) and financial resources. These could be overcome with cooperation of non-state actors. This provides support for the view that the implementation of the law is best pursued on the basis of partnership. Governing without government is not an appropriate or realistic option in the context of Malaysia at the current time.

## 8.7 Recommendations for Future Research

E-waste governance is a relatively new environmental issue. This research has produced a number of valuable insights into one aspect of its governance in Malaysia by looking at the roles of multiple actors through the lens of multiple modes of governance. More research is needed to enrich our understanding of this matter, hence contributing towards the better governance of e-waste. I suggest that future research in this field should consider the following recommendations.

The first recommendation is to continue conducting research along similar lines to note and mark out the evolution (or revolution) of e-waste governance, and the implications of the changes. This would be valuable as a learning process not only for Malaysia and the e-waste issue in the country, but also for other countries and other environmental/non-environmental governance issues so that mistakes will not be repeated and useful lessons can be drawn to increase the effectiveness of governance process. A detailed account of the role of the informal sector in e-waste governance should be given priority in future research as it has a potentially significant impact on e-waste governance.

My second recommendation for future research is to repeat this study in other countries, especially in the less economically developed countries of the Global South, by adopting a comparative framework (such as the study on solid waste governance in New Zealand and Ireland conducted by Davies (2008)). Due to similarities between the e-waste governing process in Malaysia and China, I suggest a comparative study with China should be conducted in the future. A comparative study of another country (with different economic and socio-political background) in the more economically developed world such as the UK or USA would also have the potential to produce insights for the improvement of e-waste governance in Malaysia, and possibly vice versa as well.

My third recommendation concerns methodology. A combination of qualitative and quantitative research methods should be considered for research in the future as these two methods complement each other, and thus will increase the strength of the research findings – and particularly their strength in the eyes of policy-makers. Besides that, more detailed qualitative methods, such as ethnography, would be useful in studying the socio-economic impact of e-waste governance. Finally, I would also like to recommend this method of study be adopted in studying other forms of waste, such as medical waste. The issue of medical waste has not been given sufficient attention in Malaysia, despite its hazardous nature.

# Appendices

**Appendix 1**

**Interview Template for Respondents from the Government Sector.**

**A: Policies and legislation, plans and activities**

1. Are there any unit which is specifically responsible in e-waste management in your department? How many staffs are in charge?
2. What are the programmes and activities that your department has taken in managing e-waste? When and how did it start?
3. What are your department's responsibilities with regard to e-waste management?
4. Do your department have any policy regarding e-waste management?
5. How have these policies evolved over time?
6. How are these policies and legislations set?
7. How are they monitored? (in terms of enforcement and compliance). Who are monitoring?
8. What are the effects of these policy and legislations to the overall management of e-waste?
9. Are there any policy and legislation on e-waste management at the state and federal government level that you are aware of? How did these policies affect the decision and action taken in your department?
10. Have the policies of foreign countries (eg: WEEE Directive in Europe) affected your department's policy?
11. Do your department conduct any trainings/workshops to the recycling companies or organisations? (to update knowledge on current policies, technologies, know-how etc..)
12. What are the types of permit/licence issued by your department regarding e-waste management?
13. What would you say are the main challenges your department faces in managing the e-waste issue?

**B: Partnerships**

1. Has your department established any links or associations with any other organisation, whether private or public with regard to e-waste management?
2. What form do these links/associations take?
3. When were the links/associations established?
4. How did they come about/what were the motivating factors?
5. What is the purpose of the partnerships?
6. Do you involve the public in your policies/programmes? How do you involve the public (what mechanism)? Who is 'the public' in this instance?

7. In your department's opinion, what is the role of public participation in e-waste management?
8. How do these partnerships function (committees, actors, regularity of meetings)?
9. From your point of view, what is the function of such partnership? Why do they exist, and why do you promote them?

**C: Information, transparency and accountability**

1. In managing e-waste, do you share information with other parties?
2. What is the purpose of sharing this information?
3. What limits are there on the kinds of information that can be shared, and who it can be shared with?
4. What other strategies do you undertake to foster transparency about the activities of your department?
5. How do you manage issues of accountability?

**Appendix 2**

**Interview Template for Respondents from the Private Sectors (Non-manufacturer : contractors, recyclers, etc…)**

**A: Company programmes, policies, plans and activities**

1. What is the nature of your business?
2. What products does your company manufacture? Do you use or generate e-waste in your business? Could you explain the process involving e-waste in your daily business?
3. What are the types of e-waste involve in your business? (What are the amounts of each type?)
4. Do you import any of the raw materials in your business?
5. Do you export the products/waste from your business?
6. Have you been given any training on know-how and techniques to deal with e-waste? By whom?
7. What strategies of managing e-waste is your company involved in? (Redesign, repair, refurbish, recycle and recover?)
8. Is there any policy on e-waste in your company? When did you first introduce an e-waste policy? (Do you have any documentation on your policies and programmes that I can take away with me?)
9. How has this policy evolved over time? What were the influences that led to this pattern of evolution (internal mechanisms, Malaysian government legislation, international regulation or voluntary standards…)?
10. Beyond the company itself, who is involved in dealing with the e-waste generated by your firm?
11. Does your company have e-waste targets? How are these targets set, how are they monitored, and by whom (within or outside the company)?
12. What would you say are the main challenges your company faces in the achievement of its e-waste targets?

**B: Partnerships**

1. In establishing and pursuing its e-waste policies, has your company established links or associations with any other organisation, whether private or public?
2. What form do these links/associations take?
3. When were the links/associations established?
4. How did they come about/what were the motivating factors?
5. What is the purpose of the partnerships?
6. Do you involve the public in your policies/programmes? How do you involve the public (what mechanism)? Who is ‘the public in this

instance? In your company's opinion, what is the role of public participation in e-waste management?

7. How do these partnerships function (committees, actors, regularity of meetings)?
8. Who control the partnership?
9. From your point of view, what is the function of such partnership? Why do they exist, and why do you promote them?

**C: Information, transparency and accountability**

1. In managing e-waste, do you share information with other parties? (Which parties, how is it shared, what type of information is shared…?)
2. Do you know what happened to the products from your company once its left your compound?
3. What is the purpose of sharing this information? (To improve transparency, to foster learning among companies …?)
4. What limits are there on the kinds of information that can be shared, and who it can be shared with? (Is some information commercially sensitive? Are other organisations – civil society – interested in the information? Is there enough expertise to 'deal' with the information produced?)
5. What other strategies do you undertake to foster transparency about the activities of your company? (Site visits by other organisations? Educational initiatives? Use of (global) voluntary reporting/standards? Interaction with the media?)
6. How do you manage issues of accountability? (Are government regulations sufficient to foster a sense of accountability? Or are global reporting standards more important? How about local accountability – to the places where your operations are based – do you have specific strategies in place to address these issues?)

**Appendix 3**

**Interview Template for Respondents from the Private Sectors (Manufacturers)**

**A: Company programmes, policies, plans and activities**

1. What products does your company manufacture?
2. What post-production and after-sales e-waste does this production process generate? (Types, amounts)
3. What are the strategies used to manage e-waste in your company? (Redesign, take back policy, reuse, recycle?)
4. When did you first introduce an e-waste policy? (Do you have any documentation on your policies and programmes that I can take away with me?)
5. How has this policy evolved over time? What were the influences that led to this pattern of evolution (internal mechanisms, Malaysian government legislation, international regulation or voluntary standards…)?
6. How has the policy effects the profit and sales of your company?
7. How has the rules and regulations imposed by the Malaysian Government and foreign government ( eg: EU's WEEE Directive, Japan's Law on e-waste) effect your company?
8. Beyond the company itself, who is involved in dealing with the e-waste generated by your firm?
9. Does your company have e-waste targets? How are these targets set, how are they monitored, and by whom (within or outside the company)?
10. What would you say are the main challenges your company faces in the achievement of its e-waste targets?

**B: Partnerships**

1. In establishing and pursuing its e-waste policies, has your company established links or associations with any other organisation, whether private or public?
2. What form do these links/associations take?
3. When were the links/associations established?
4. How did they come about/what were the motivating factors?
5. What is the purpose of the partnerships?
6. Do you involve the public in your policies/programmes? How do you involve the public (what mechanism)? Who is 'the public in this instance? In your company's opinion, what is the role of public participation in e-waste management?

7. How do these partnerships function (committees, actors, regularity of meetings)? Which party is having the control over the partnership?
8. From your point of view, what is the function of such partnership? Why do they exist, and why do you promote them?

**C: Information, transparency and accountability**

1. In managing e-waste, do you share information with other parties? (Which parties, how is it shared, what type of information is shared…?)
2. What is the purpose of sharing this information? (To improve transparency, to foster learning among companies …?)
3. What limits are there on the kinds of information that can be shared, and who it can be shared with? (Is some information commercially sensitive? Are other organisations – civil society – interested in the information? Is there enough expertise to 'deal' with the information produced?)
4. What other strategies do you undertake to foster transparency about the activities of your company? (Site visits by other organisations? Educational initatives? Use of (global) voluntary reporting/standards? Interaction with the media?)
5. How do you manage issues of accountability? (Are government regulations sufficient to foster a sense of accountability? Or are global reporting standards more important? How about local accountability – to the places where your operations are based – do you have specific strategies in place to address these issues?)

**Appendix 4**

**Interview Template for Respondents from the Civil Society Organisation (CBOs & NGOs)**

**A: Organisations programmes, policies, plans and activities**

1. Can you briefly tell me the history of your organisation?
2. What are the objectives of your organisation?
3. What is the status of your organisation? (Locally registered or are there any affiliations with any international organisations).
4. How is your organisations funded? ( Do you have any documentation/ written source of info on your organisations that I can refer to/ take with me?)
5. What are the main activities and programmes carried out by your organisation, with regard to e-waste? (Who are involved in these programmes)
6. When did you organisation first launch an e-waste related activities/programmes? (Do you have any documentation on your programmes that I can take away with me?)
7. Has your activities/programme evolved? How has this programmes evolved over time? What were the influences that led to this pattern of evolution (internal mechanisms, Malaysian government legislation, international regulation or voluntary standards…)?
8. What e-waste management strategies does your organisation promote? (Redesign, reuse, recycle?)
9. What are the targets of your organisation in dealing with e-waste?
10. What would you say are the main challenges your organisation faces in the achievement of these targets?

**B: Partnerships**

1. In organising your e-waste programmes, has your organisation established links or associations with any other organisation, whether private or public?
2. What form do these links/associations take?
3. When were the links/associations established?
4. How did they come about/what were the motivating factors?
5. What is the purpose of the partnerships?
6. Do you involve the public in your programmes? How do you involve the public (what mechanism)? Who is 'the public' in this instance? In your organisation's opinion, what is the role of public participation in e-waste management?
7. How do these partnerships function (committees, actors, regularity of meetings)?

8. From your point of view, what is the function of such partnership? Why do they exist, and why do you promote them?

**C: Information, transparency and accountability**

1. How do you/your organisation gather information regarding e-waste?
2. Have you received any information / been informed on the government's plan and action regarding management of e-waste? How? Have you been invited to meetings etc..
3. In your opinion, is the transparency level of the government dept sufficient?
4. What about information from private companies (manufacturer, recycling companies, licensed recovery company? ( About their strategies and plan to manage e-waste, what they are doing etc…)
5. How do you rate the level of transparency in the companies?
6. In managing e-waste, do you share information with other parties? (Which parties, how is it shared, what type of information is shared…?)
7. What is the purpose of sharing this information? (To improve transparency, to foster learning among actors and civil society …?)
8. What limits are there on the kinds of information that can be shared, and who it can be shared with? (Is some information sensitive? Are other organisations – civil society – interested in the information? Is there enough expertise to 'deal' with the information produced?)
9. What other strategies do you undertake to foster transparency about the activities of your organisation? (Visits by other organisations? Educational initiatives? Use of (global) voluntary reporting/standards? Interaction with the media?)
10. How do you manage issues of accountability? (Are government regulations sufficient to foster a sense of accountability? Or are global reporting standards more important? How about local accountability – to the places where your operations are based – do you have specific strategies in place to address these issues?)

**Appendix 5**

**Interview Transcripts' Reference List**

| Category of actors | Sub-category | Transcripts reference number | Date of interview | Respondents reference as appeared in text |
|---|---|---|---|---|
| State | Federal government | 1 | 27 November 2008 | Respondent # 1, government, interviewed on 27 November 2008 |
| | | 2 | 27 November 2008 | Respondent # 2, government, interviewed on 27 November 2008 |
| | | 3 | 13 December 2008 | Respondent # 3, government, interviewed on 13 December 2008 |
| | | 4 | 3 September 2009 | Respondent # 4, government, interviewed on 27 November 2008 |
| | State government | 5 | 17 March 2009 | Respondent # 5, government, interviewed on 17 March 2009 |
| | Local government (Municipalities/ local councils) | 6 | 16 December 2008 | Respondent # 6, government, interviewed on 16 December 2008 |
| | | 7 | 6 March 2009 | Respondent # 7, government, interviewed on 6 March 2009 |
| | | 8 | 26 November 2008 | Respondent # 8, government, interviewed on 26 November 2008 |
| | | 9 | 20 January 2009 | Respondent # 9, government, interviewed on 20 January 2009 |
| Non-state: Private sector actor | Electrical and electronic equipment manufacturers | 10 | 12 November 2009 | Respondent # 10, private sector actor, interviewed on 12 November 2009 |
| | | 11 | 19 January 2009 | Respondent # 11, private sector actor, interviewed on 19 January 2009 |
| | | 12 | 22 January 2009 | Respondent # 12, private sector actor, interviewed on 22 January 2009 |
| | | 13 | 25 November 2008 | Respondent # 13, private sector actor, interviewed on 25 November 2008 |
| | | 14 | 24 | Respondent # 14, private |

| Category of actors | Sub-category | Transcripts reference number | Date of interview | Respondents reference as appeared in text |
|---|---|---|---|---|
| | | | November 2008 | sector actor, interviewed on 24 November 2008 |
| | | 15 | 19 January 2009 | Respondent # 15, private sector actor, interviewed on 19 January 2009 |
| | | 16 | 17 December 2008 | Respondent # 16, private sector actor, interviewed on 17 December 2008 |
| | | 17 | 28 October 2008 | Respondent # 17, private sector actor, interviewed on 28 October 2008 |
| | Retailers, sales and services | 18 | 21 January 2009 | Respondent # 18, private sector actor, interviewed on 21 January 2009 |
| | | 19 | 23 February 2008 | Respondent # 19, private sector actor, interviewed on 23 February 2008 |
| | | 20 | 21 January 2009 | Respondent # 20, private sector actor, interviewed on 21 January 2009 |
| | Tele-communication service provider (Telco) | 21 | 23 February 2009 | Respondent # 21, private sector actor, interviewed on 23 February 2009 |
| | E-waste contractors | 22 | 1 March 2009 | Respondent # 22, private sector actor, interviewed on 1 March 2009 |
| | | 23 | 20 November 2008 | Respondent # 23, private sector actor, interviewed on 20 November 2008 |
| | | 24 | 27 November 2008 | Respondent # 24, private sector actor, interviewed on 27 November 2008 |
| | | 25 | 19 December 2008 | Respondent # 25, private sector actor, interviewed on 19 December 2008 |
| | | 26 | 4 March 2009 | Respondent # 26, private sector actor, interviewed on 4 March 2009 |
| | Solid waste concessionaires | 27 | 19 January 2009 | Respondent # 27, private sector actor, interviewed on 19 January 2009 |
| | | 28 | 18 | Respondent # 28, private |

| Category of actors | Sub-category | Transcripts reference number | Date of interview | Respondents reference as appeared in text |
|---|---|---|---|---|
| | | | November 2008 | sector actor, interviewed on 18 November 2008 |
| | Scrap dealers, scavengers | 29 | 17 March 2009 | Respondent # 29, private sector actor, interviewed on 17 March 2009 |
| | | 30 | 2 February 2009 | Respondent # 30, private sector actor, interviewed on 2 February 2009 |
| | | 31 | 18 February 2009 | Respondent # 31, private sector actor, interviewed on 18 February 2009 |
| | Second hand items shops, repair shops | 32 | 8 March 2009 | Respondent # 32, private sector actor, interviewed on 8 March 2009 |
| | | 33 | 25 February 2009 | Respondent # 33, private sector actor, interviewed on 25 February 2009 |
| | | 34 | 17 March 2009 | Respondent # 34, private sector actor, interviewed on 17 March 2009 |
| Non-state: CBOs | Neighbourhood Watch Groups (*Rukun Tetangga)* | 35 | 18 Nov 2008 | Respondent # 35, CBO, interviewed on 18 Nov 2008 |
| | | 36 | 1 March 2009 | Respondent # 36, CBO, interviewed on 1 March 2009 |
| | | 37 | 1 March 2009 | Respondent # 37, CBO, interviewed on 1 March 2009 |
| | | 38 | 1 March 2009 | Respondent # 38, CBO, interviewed on 1 March 2009 |
| | | 39 | 1 March 2009 | Respondent # 39, CBO, interviewed on 1 March 2009 |
| | | 40 | 2 March 2009 | Respondent # 40, CBO, interviewed on 2 March 2009 |
| | Residents' Associations | 41 | 2 April 2009 | Respondent # 41, CBO, interviewed on 2 April 2009 |
| | | 42 | 27 February 2009 | Respondent # 42, CBO, interviewed on 27 February 2009 |
| | | 43 | 2 April 2009 | Respondent # 43, CBO, interviewed on 2 April 2009 |
| | | 44 | 27 November 2008 | Respondent # 44, CBO, interviewed on 27 November 2008 |
| | | 45 | 1 April | Respondent # 45, CBO, |

| Category of actors | Sub-category | Transcripts reference number | Date of interview | Respondents reference as appeared in text |
|---|---|---|---|---|
| | | | 2009 | interviewed on 1 April 2009 |
| | | 46 | 2 April 2009 | Respondent # 46, CBO, interviewed on 2 April 2009 |
| Non-state: NGOs | Associations | 47 | 22 January 2009 | Respondent # 47, NGO, interviewed on 22 January 2009 |
| | | 48 | 21 November 2008 | Respondent # 48, NGO, interviewed on 21 November 2008 |
| | | 49 | 13 November 2008 | Respondent # 49, NGO, interviewed on 13 November 2008 |
| | | 50 | 27 February 2009 | Respondent # 50, NGO, interviewed on 27 February 2009 |
| | Charity | 51 | 27 Oct 2008 | Respondent # 51, NGO, interviewed on 27 Oct 2008 |
| | | 52 | 3 March 2009 | Respondent # 52, NGO, interviewed on 3 March 2009 |
| | Environmental groups | 53 | 4 March 2009 | Respondent # 53, NGO, interviewed on 4 March 2009 |
| | | 54 | 28 October 2008 | Respondent # 54, NGO, interviewed on 28 October 2008 |
| | GONGO | 55 | 18 December 2008 | Respondent # 55, NGO, interviewed on 18 December 2008 |
| | | 56 | 3 March 2009 | Respondent # 56, NGO, interviewed on 3 March 2009 |

**Appendix 6**

**Coding Categories for Data Analysis**

| Related research question | Category | Sub-category | Category code |
|---|---|---|---|
| How independent are the NSA from government's influence?<br><br>What capacities and abilities do NSA have that shapes their role in environmental governance. | Actors/ organisations' background | Characteristics<br><br>Capacities<br>Abilities | Characteristics<br><br>Capacities<br>Abilities |
| Are there any policies regarding e-waste?<br>What are the implications of the implementation of the policies? | Policy | | Policy |
| How are actors involved in environmental governance | Roles | Policy making<br>Influence policy making<br>Promote values transformation<br>Facilitate public participation | RoPM<br>RoIPM<br><br>RoVT<br><br>RoFPP |
| How NSA facilitate public participation | Public participation | Mediator<br>Collection centres<br>CSR | PPM<br>PPCC<br><br>PPCSR |
| Why are actors involved in environmental governance | Reasons | Responsibility<br>Environmental concerns<br>Social concerns<br>Political concerns<br>Economic reasons<br>Self interest | ReR<br>ReEnv<br><br>ReSoc<br>RePol<br><br>ReEcon<br><br>ReSI |
| What are the motivating factors for actors to be involved in e-waste governance? | Motivating factor | | Motivate |
| What are the challenges in playing their roles in e-waste governance | Challenges | Funding<br>Social barriers<br>Space<br>Political | ChF<br>ChSoc<br>ChSpace<br>ChPol |

**Appendix 7**

**Coding Categories for Data Analysis on PPP (Transcripts of PPP Partners)**

| Related research question | category | Sub- category | code |
|---|---|---|---|
| What are the arrangements and structure of the PPP? | Arrangements and structure | Partnership 1<br><br>Partnership 2 | PPP A&S – P1<br>PPP A&S-P2 |
| Why do actors work in PPP? | Reasons | | PPP Re |
| What are the motivating factors to participate in the partnership? | Motivating Factor | | PPP Motivate |
| What are the implications of PPP? | Implications | | PPP Implications |
| What are the roles of actors in PPP? Are partners aware of their own roles and the roles of other partners in the PPP? | Roles | | PPP Roles |
| What shapes the roles of actors in PPP? | Capacities and abilities | | PPP C&A |
| How and why is the PPP important to participants? | Importance of issue | | PPP Issue |
| How concern are partners with the partnership? Are partners aware of the partnerships goals and objectives? | Goals and objectives | | PPP Goal |
| How transparent is the communication among partners? | Communication | | PPP Comm |
| How is transparency achieved? | Transparency | | PPP Trans |
| How committed are partners to PPP? | Commitment | | PPP Commitment |
| What are the levels of trust and interdependency among partners | Interdependency<br><br>Trust | | PPP Depent<br><br>PPP Trust |
| What are the challenges faced by the participants? | Challenges | | PPP Challenge |

**Appendix 8**

**Sample Coded Transcript (1)**

| |
|---|
| Transcript reference number: 8<br>Respondent's reference: Respondent # 8, government, interviewed on 26 November 2008 |

*Q: Is your department involves in any kind of partnership regarding e-waste. I mean, does your department have any link and association with other government agencies, commercial firms, NGOs, or with community-based organizations.*

A: I have to tell you very frankly that there is not much that we have regarding e-waste. ***[ PPP Issue ]*** What we have done so far is to partner with XX to recycle computer and computer peripherals. That's all.

*Q: Could you please explain more about the partnership such as the structure and mechanism.*

A: XX approached us under the LA 21 partnership programme. They not started it anywhere else except in Penang. Show how to dispose off e-waste with their partner, YY in Penang. YY is the e-waste contractor for XX. They are accredited by DOE and KA *(Kualiti Alam).* Then we create the partnership. Then we call the RA*(Residents' Associations)* and RT*(Rukun Tetangga-Neighbourhood Watch Group)* to join us. This programme was started in 2006. At this moment, there are nine centres been put up to collect used computers at scheduled time table. What happened is that, YY will pay 80 cents, 40 cents will be kept by the RT for their activities and 40 cents given to individual. So to encourage and to keep up the momentum, lucky draws were carried once a year. For this year, this activity was carried out for the whole of last month (November 2008) with conjunction with national recycling day. 10 prizes were given away. ***[ PPP A&S – P2 ]***

*Q: What is the objective of this programme?*

A: To ensure disposal of e-waste is done in a proper manner. ***[ PPP Obj ]***

*Q: Why do you take part in this partnership?*

A: Responsibility under LA 21. ***[PPP Re]***

*Q: Can you explain your role in this partnership?.*

A: Recycling is the major activity for our department. We are constantly finding and exploring new way of doing things.***[PPP Re]*** We also work in partnership with other partners in other programme other than e-waste.

*Q: What are the motivating factors for your department to be a part of this partnership?*

A: We (ZZ and other partners) felt that the awareness on e-waste, their hazardous effect and the need for proper disposal is still low in our community. That's the common motivating factor that I believed is shared by all partners. ***[PPP Motivate]***

Apart from that there are also other motivating factors which are unique to each partner. For example, to us in ZZ this programme is a way for us to promote SD. To explore new ideas that people constantly overlook. ***[PPP Motivate]*** In line with implementation of SD.For XX, I think it is more for their CSR. For YY, its for profit of course. For CBOs and NGOs, it is mainly because they want to add new type of recyclable items since most of them have started with recycling programme. They need money to fund their activities. ***[PPP Motivate+PPP Re]***

*Q: How frequent do all members or partners meet?*
A: We had a few meeting when we first start on the mechanism of the programme. Some were conducted here, others in Penang. We were also invited to visit XX and YY. After the programme was launched and is running smoothly now, then we just let it go on. There is no more meeting between us now. Now that the programme has sail off smoothly, we rarely meet. Once a month I met people from YY when they came over for collection. ***[PPP Comm+PPP Commitment]***

*Q: How about the commitment of other actors in your opinion?*
A: Ok. ***[PPP Commitment]***

*Q: Could you please elaborate on the communication with other partners.*
A: Communicating with XX can be quiet difficult. As a big organization with a regional office based in Singapore, deciding on simple things than take a long time. XX they have the corporate comm (*communication)* section. Everything must go through several levels. For example all the speeches for our launching day have to be vetted by the legal department. Even, the publicity brochure has to go through their corporate comm. They check if logo correct or not. The colour correct or not. ***[PPP Comm]***

**Appendix 9**

**Sample Coded Transcript (2)**

| |
|---|
| Transcript reference number: 42<br>Respondent's reference: Respondent # 42, CBO, interviewed on 27 February 2009 |

*Q: Could you please explain about the mechanism of the partnership.*
A: When we first started in 2006, XX paid RM0.50/kg for the public. But in 2007 until now, XX introduced a 50:50 formula, where RM0.80 is paid/kg, half will go to the public and half is for the collection centre to keep. But, even though XX gave us RM0.80/kg now, we still give the public RM0.50/kg and keep only RM0.30/kg instead. On top of that on our own initiative, we managed to partner up with a publishing house, and they gave us unsold magazines to be distributed to the public. When the public sent in their computers, they will receive money and magazines. Five various titled magazines for a monitor and ten magazines for a set of computer. When we have collected a good amount, I will call XX or YY, and we will arrange time and date for collection. ***[PPP A&S-P2]***

Most of the time, I call YY. Because normally I use my handphone to make calls. My mobile service provider cannot reach XX toll free number. ***[PPP Comm]***

*Q: How often do you call YY to come down?*
A: It really depends on how much is your collection. I will only call them to come down if I feel we have got a sensible amount. ***[PPP Comm]***

They came all the way from Butterworth you know. ***[PPP Commitment]*** I don't think it is worth it for them to travel all the way to collect just 3 monitors!

*Q: How was the response from the public towards this partnership programme so far?*
A: No particular trend. There was once, someone sent in 12 sets of computer at a time. During bad time, we just collected 3 units in a month. It really depend on your luck. Overall we collected about 100 kilograms in 2007, maybe slightly less…. and in 2008 we collected more than 1000 kilograms. I consider that a huge success.

*Q: How about your communication with the other partners of this partnership? How often do you meet other partners?*
A: We never meet in formal meetings. My tight schedule and heavy responsibility as a teacher in a school just wouldn't allow me to. However we frequently used other type of communication, via telefon and sms *(text messaging system)* for example. Anyway, our major partners such as XX and

YY are based in Penang. Meeting up physically wouldn't be that easy. And whenever there are functions such as exhibitions we will meet.***[PPP Comm+PPP Commitment]***

*Q: How are you kept updated on the progress of the programme?*
A: Normally Mr LLS of ZZ will sms or call us to inform of any progress or invite us for any function. For example, there are lucky draw competition carried out every year, and XX will normally follow-up by calling us up to ensure that we are kept informed and are invited.***[PPP Comm]***

*Q: How do you trust other partners?*
A: Trust is a very important element in partnership.Because of trust this programme can grow and recycling habits existed. We give full trust to XX and ZZ to plan, develop and control this programme. ***[PPP Trust]*** We just help them. If we don't trust them we can always sell the e-waste directly to recycling company at a much higher rate. But we cannot be sure where would it end? Whether it will be disposed properly?***[PPP Trust]***

That is why we agree to be a part of this partnership programme. We trust that XX and ZZ know well how to handle this. This is actually their expertise.***[PPP Trust]***

There are times when I received computers which are not so old, that I give them free to another CBO. This is because they have the people who know how to repair and upgrade computer to serve normal users. They will repair and sell the computers. The money will be distributed for donation at the end of every year.

*Q: Do you know what is the objective of this programme?*
A: I am not very sure. ***[PPP Obj]*** I was invited by Mr LLS to join. I've known Mr LLS. We met in 2004 during the launching of Recycling Programme at Menara ZZ. I think it is a way to let more people know that by recycling they can help to conserve the environment, and also as a way to support the Recycling Programme.***[PPP Obj]***

*Q: Why did you decided to take part and be a partner in this programme. Objectives of involvement*
A: We want to take proactive measures before we are ordered to do so.***[PPP Re]***

*Q: Can you describe the participation and commitment from all partners.*
A: Different kind of contribution from different partners. For example, for us who operate the collection centres, ***[PPP Roles]***even though we have tried our best and put all our energy in, it may not produce the desired results….the results that truly manifested our effort. We can promote *(this programme)* very well, but if the public doesn't have any computers to throw away, how do you

thick we can increase our collection rate. For example if you are located at a rural area, or sub-urban area, things may be more diffucult. Location and target group is crucial.***[PPP Challenge]***

For example, DJROA, even without much effort, they can collect huge amount of computer because it is an elite area. For areas like here, the strategy that we can adapt is to avoid residence from selling e-waste to old newspaper man, because we can't be sure how it is being disposed.

Methods of operation also play a role. The collection centre in SS3 for example use only drop-off mechanism. People come and drop their computers and no cash is given, and this centre is managed by aged man. Many of them are not able to carry the computers. The place can be a mess at time. Sometimes I brought my SR team to help them organized the place.***[PPP Challenge+PPP Commitment]***

*Q: Commitment of partners and sense of belongings.*
A: As far as promotion, we have given our best. ***[PPP Commitment]*** I can't answer for other partners. But because we operated at limited time, as this is a voluntary work. ***[PPP Challenge]***

Many people complain. They said they are not aware of the schedule. When they are ready to dispose, the date of collection is end of the month, for example….and the waste will mess their house until next collection date next month, as many collection centres only open once a month. That is so not convenient for many people.***[PPP Challenge]***

**Appendix 10**

**The responsibilities of waste generators according to the Environmental Quality (Scheduled Wastes) Regulations 2005:**

- To notify the Director General of Environment of the categories and quantities of wastes generated within 30 days of generation (Regulation 3)
- To ensure proper storage, treatment, disposal and recovery of material. To make sure that treatment and recovery of material, and disposal of waste and residual of treatment and recovery are done only at prescribed premises (Regulations 4, 5, 6 and 8)
- To ensure that labelling and transportation are done in accordance with the guidelines prescribed by the Director General (Regulations 8 and 10)
- To keep accurate and up-to-date inventories of the categories and quantities of waste generated, treated and disposed of, and materials recovered for a period up to three years from the date the waste was generated (Regulation 11)
- To complete part 1 of the Sixth Schedule and retain a signed copy as a record for at least three years (Regulation 12)
- To provide information in accordance with the Seventh Schedule in respect of each category of waste to be delivered to a contractor (Regulation 13)
- To provide technical expertise and supporting assistance in any clean-up operation in the event of a spill or accidental discharge (Regulation 14)
- To ensure that all employees who are involved in handling e-waste attend training programmes (Regulation 15)

Source: Environmental Quality (Scheduled Wastes) Regulation 2005

**The responsibilities of waste contractors according to the Environmental Quality (Scheduled Wastes) Regulations 2005:**

- To provide information in accordance with the Sixth Schedule and to complete Part II (Regulation 11), and to retain a signed copy for three years (Regulation 12)
- To deliver the waste within 10 days from the date of receipt of scheduled waste to prescribed premises (Regulation 12)
- To avoid densely populated areas, water catchment areas and other environmentally sensitive areas during transportation of scheduled wastes between any two points and to carry the Seventh Schedule and comply with the instruction contained in the schedule (Regulation 13)

- To ensure that all employees attend training programmes and are well informed of the purpose and use of the Seventh Schedule (Regulation 13)
- In case of a spill or accidental discharge (Regulation 14), the waste contractor should immediately inform the Director General, and do everything that is practicable to contain, cleanse or abate the spill or accidental discharge and to recover substances involved in the spill or accidental discharge, and undertake studies to determine the impact of the spillage or accidental discharge on the environment over a period of time to be determined by the Director General.

Source: Environmental Quality (Scheduled Wastes) Regulation 2005

# References


Agamuthu, P., Fauziah, S.H., and Khidzir, K., 2009. Evolution of Solid Waste Management in Malaysia: Impacts and Implications of the Solid Waste Bill, 2007. *Journal of Material Cycles and Waste Management.* 11, pp 96 – 103.

Ahmed, S.A. and Ali, S.M., 2006. People as partners: Facilitating people's participation in public-private partnerships for solid waste management. *Habitat International*, 30, pp.781-796.

Ahmed, S.A. and Ali, S.M., 2004. Partnerships for Solid Waste Management in Developing Countries: Linking Theories to Realities. *Habitat International,* 28(3), pp.467 - 479.

Aizawa, H., Yoshida, H., and Sakai, S.I., 2008.Current Results and Future Perspectives for Japanese Recycling of Home Electrical Appliances. *Resources, Conservation and Recycling,* 52 (12), pp. 1399 – 1410.

Ali, M., and Snel, M., 1999. *Lesson From Community-based Initiatives in Solid Waste.* WELL (Water and Environmental Health at London and Loughborough) Task No:99. Available from: http://www/lboro.ac.uk/well/. [Accessed 18 September 2010].

Andreola, F., Barbieri, I., Corradi, A., Ferrari, A.M., Lancellotti, I., and Neri, P., 2007. Recycling of EOL CRT Glass into Ceramic Glaze Formulations and its Environmental Impacts by LCA Approach. *International Journal of Life Cycle Assessment,* 12, pp. 448 – 454.

Appadurai, A., 1996. *Modernity at Large: Cultural Dimensions of Globalisation.* Minneapolis: University of Minnesota Press.

Arksey,H. and Knight, P., 1999. *Interviewing For Social Scientist.* London: Sage Publication Ltd.

Auld, G., Bernstein, S., Cashore, B., 2008. The New Corporate Social Responsibility. *Annual Review of Environmental Resources*, 33, pp. 413 – 435.

Awang, A.R., 2010. *E-waste Management in Malaysia.* Available from: http://www.unep.or.jp/ietc/spc/news-jul10/Malaysia_(Dr.RahmanAwang).pdf [Accessed 10 November 2010].

Babu, B.R., Parande, A.K., Basha, C.A., 2007. Electrical and Electronic Waste: A Global Environmental Problem. *Waste Management Resources*, 25, pp. 307 – 318.

Bandyopadhyay,A., 2008. Indian Initiatives on E-waste Management – A Critical Review. *Journal of Material Cycles and Waste Management*, 25(10), pp. 1507-1526.

Barr, S., 2004. Are We All Environmentalists Now? Rhetoric and Reality in Environmental Action. *Geoforum*, 35(2), pp. 231 – 249.

Basel Convention on the control of Transboundary Movements of Hazardous Wastes and their Disposal website. Available from: http://www.basel.int. [Accessed 5 June 2009].

Bell, S and Hindmoor, A., 2009. *Rethinking Governance. The Centrality of the State in Modern Society.* New York: Cambridge University Press.

Bell, S, Hindmoor, A. and Mols, F., 2010. Persuasion as Governance: A State-Centric Relational Perspective. *Public Administration.* 88 (3), pp. 851 – 870.

Betsill, M.M., and Bulkeley, H., 2006. Cities and the Multilevel Governance of Global Climate Change. *Global Governance.* 12, pp.141 – 159

Betts, K., 2008. Producing Usable Materials from E-waste. *Environmental Science and Technology*, 42, pp. 6782 -6793.

Bird, C.M., 2005. How I Stopped Dreading and Learned to Love Transcription. *Qualitative Inquiry*, 11, pp. 226 – 248.

Boyatzis, R.E., 1998. *Transforming Qualitative Information. Thematic Analysis and Code Development.* Thousand Oaks, California: Sage Publication, Inc.

Braub, V. and Clarke, V., 2006. Using Thematic Analysis in Psychology. *Qualitative Research in Psychology*, 3, pp. 77-101.

Bulkeley, H., Watson, M., and Hudson, R., 2007. Modes of Governing Municipal Waste. *Environment and Planning A*, 39, pp. 2733 – 2753.

Bulkeley, H., Watson, M., Hudson, R., and Weaver, P., 2005. Governing Municipal Waste: Towards a New Analytical Framework. *Journal of Environmental Policy & Planning*, 7 (1), pp. 1 – 23.

Bulkeley, H. and Betsill, M., 2003. *Cities and Climate Change: Urban Sustainability and Global Environmental Governance.* London: Routledge.

Campbell, M.I., and Hasan, A., 2003. Design Evaluation Method for the Disassembly of Electronic Equipment. *Proceedings of International*

*Conference on Engineering Design (ICED '03).* August 2003, Stockholm, Sweden, pp. 19 – 21.

Chancerel, P., and Rotter, S., 2009. Recycling-oriented Characterization of Small Waste Electrical and Electronic Equipment. *Waste Management.* 29, pp. 2336 – 2352

Cobbing, M., 2008. Toxic Tech: Not in Our Backyard. Uncovering the Hidden Flows of E-waste. *Report from Greenpeace International,* Amsterdam. Available from: http:www.greenpeace.org/raw/content/Belgium/fr/press/reports/toxic-tech.pdf. [Accessed 2 February 2010].

Creswell, J.W., 2007. *Qualitative Inquiry and Research Design. Choosing Among Five Approaches. 2nd ed.* Thousand Oaks, California: Sage Publication, Inc.

Cui, J., and Forssberg, E., 2003. Mechanical Recycling of Waste Electric and Electronic Equipment: A Review. *Journal of Hazard Material,* 99, pp. 243-263.

Cui, J.R., and Zhang, L.F., 2008. Metallurgical Recovery of Metals from Electronic Waste: A Review. *Journal of Hazard Material,* 158, pp. 228-256.

Curran, A., and Williams, I.D., 2010. The Role of Furniture and Appliances Re-use Organisations in England and Wales. *Resources, Conservation and Recycling,* 54, pp. 692 – 703.

Darby, L., and Obara, L., 2005. Household Recycling Behaviour and Attitudes Towards the Disposal of Small Electrical and Electronic Equipment. *Resources, Conservation and Recycling,* 44, pp. 17 – 35.

Darlow, A. and Newby, L., 1997. Partnerships: Panacea or pitfall? Experience in Leicester Environment City. *Local Environment,* 2(1), pp. 73 – 81.

Davies, A.R., 2002. Power, Politics and Networks: Shaping Partnerships for Sustainable Communities. *Area,* 34(2), pp. 190 – 203.

Davies, A.R., 2008. *The Geographies of Garbage Governance.* Hampshire: Ashgate Publishing Limited

Davies, A.R., 2009. Clean and Green? A Governance Analysis of Waste Management in New Zealand. *Journal of Environmental Planning and Management,* 52(2), pp. 157 – 176.

Davies, A., Fahy, F., and Taylor, D., 2005. Mind the Gap! Householders Attitudes and Actions towards Waste in Ireland. *Irish Geography,* 38(2), pp. 151 – 168.

Davis, G., and Heart, S., 2008. Electronic Waste: The Local Government Perspective in Queensland, Australia. *Resources Conservation and Recycling.* 52 (8-9), pp. 1031 – 1039.

Davoudi, S., 2009. Scalar Tensions in the Governance of Waste: The Resilience of State Spatial Keynesianism. *Journal of Environmental Planning and Management,* 52, pp. 137 – 156.

Davoudi, S., 2000. Planning for Waste: Changing Discourse and Institutional Relationships. *Planning in Progress,* 53, pp. 165 – 216.

Davoudi, S., and Evans, N., 2005. The Challenge of Governance in Regional Waste Planning. *Environmental and Planning C: Government and Policy*, 23, pp. 493 – 517.

De Angelis, M., 2003. Neoliberal Governance, Reproduction and Accumulation. *The Commoner.* 7:1 -28

Deathe, A.L.B., MacDonald, E. and Amos, W., 2008. E-waste Management Programme and the Promotion of Design for the Environment: Assessing Canada's Contributions. *RECIEL.* 3, pp. 321 – 362.

Dell website. Available from: http://www.dell.com.my/. [Accessed 12 August 2008].

Delmas, M., and Keller, A., 2005. Free Riding in Voluntary Environmental Programs: The Case of the U.S.EPA WasteWise Program. *Policy Sciences,*38, pp. 91 – 106.

Denscombe, M., 2005. *The Good Research Guide for Small-scale Social Research Projects. 2nd ed*. Maidenhead, England: Open University Press.

Devi, S.B., Shobha, S.V., and Kamble, R.K., 2004. E-Waste: The Hidden Harm of Technological Revolution. *Journal of Indian Association for Environmental Management.* 31, pp. 196 – 205

Dinica, V., and Bressers, H., 2004. Partnerships in Implementing Sustainable Policies – Theoretical Considerations and Experiences from Spain. *Paper Presented 12th International Conference of Industry Network, Hong Kong,* November 7 -10, 2004.

Dryzek, J. S., 2000. *Deliberative Democracy and Beyond. Liberals, Critics, Contestations.* Oxford: Oxford University Press.

Duffy, R., 2006. Non-governmental Organisations and Governance States: The Impact of Transnational Environmental Management Networks in Madagascar. *Environmental Politics,* 15(5), pp. 731 – 749.

Dwivedy, M. and Mittal, R.K., 2010. Estimation of Future Outflows of E-waste in India. *Waste Management.* 30, pp. 483 – 491.

E-waste Inventory Project in Malaysia Report, 2009. Available from: http://www.basel.int/techmatters/e-wastes/projReport30_07_09.pdf. [Accessed 12 October 2010].

Eberlein, B. and Kerwer, D., 2004. New Governance in the EU: A Theoretical Perspective. *Journal of Common Market Studies.* 42(1), pp. 121 – 142.

Edelenbos, J. and Teisman, G.R., 2008. Public-private partnership: on the edge of project and process management. Insights from Dutch practice: the Sijtwende spatial development project. *Environmental and Planning C: Government and Policy.* 26, pp. 614 – 626

Enviros, 2002.*Potential Market for Waste Electronic and Electrical Equipment (WEEE).* Available from: http://www.londonremade,com/london_remade/download-files/. [Accessed 25 May 2006].

EU Directive. *Directive 2002/96/EC, on WEEE (Waste Electrical and Electronic Equipment.* Available from: http://ec.europa.eu/environment/waste/weee/legis_en.htm [Accessed 24 August 2009].

EU Directive. *Directive 2002/95/EC), on RoHS (The Restrictions of the Use of Certain Hazardous Substances).* Available from: http://ec.europa.eu/environment/waste/weee/legis_en.htm .[Accessed 24 August 2009].

EU Directive. *Directive 2006/12/EC, on Definition of Waste*. Available from: http://ec.europa.eu/environment/waste/weee/legis_en.htm .[Accessed 24 August 2009].

Envocare . Mobile phones in UK. Available from: http://www.envocare.co.uk/mobile_phones.htm. [Accessed 14 January 2010].

Ernst, T., Popp, R., Wolf, M., van Eldik, R., 2003. Analysis of Eco-relevant Elements and Noble Metals in Printed Wiring Boards Using AAS, ICP-AES and EDXRF. *Anal Bioanal Chem*, 375, pp. 805 – 814.

Eugster, M., and Fu, H., 2004. E-Waste Assessment in China- case study in Beijing.

Fairbrass, J., and Jordan, A., 2002. The Europeanisation of Interest Representation: The Case of UK Environmental Policy. In Warleigh, A., and Fairbrass, J., (eds), *Influence and Interests in the European Union: The New Politics of Persuasion and Advocacy.* London: Europa.

FOMCA website. Available from: www: fomca.org.my. [Accessed 24 January 2009].

Forsyth, T., 2005. Building deliberative public-private partnerships for waste management in Asia. *Geoforum,* 36, pp. 429 – 439.

Forsyth, T., 2006. Cooperative Environmental Governance and Waste-to-Energy Technologies in Asia. *International Journal of Technology Management and Sustainable Development,* 5 (3), pp. 209 - 220.

George, A.L. and Bennett, A., 2005. Case Studies and Theory Development in the Social Sciences. Massachusetts: MIT Press.

George, A.L. and McKeown, T.J., 1985. Case Studies and Theories of Organisational Decision Making, in Coulam, R.F. and Smith, R.A., eds., 1985. *Advances in Information Processing in Organisations. Vol.2.* Greenwich, Connecticut.: JAI Press. (pp. 21 – 58).

Global e-Sustainability Initiative (GeSI). Available from: http://www.gesi.org. [Accessed 3 January 2010].

Goosey, M., 2004. End-of- life Electronics Legislation – An Industry Perspective. *Circuit World,* 30(2), pp. 41 -45.

Government of Malaysia, Department Of Environment. *Organisation Chart*. Available from: http://www.doe.gov.my [Accessed 14 August 2009].

Government of Malaysia. *Environmental Quality (Scheduled Wastes) Regulation 2005*. Available from: http://www.doe.gov.my/v2/files/legislation/pua0294y2005.pdf [Accessed 3 September 2009].

Government of Malaysia. *Environmental Quality (Scheduled Wastes) Regulation 1989*. Available from:

*http://www.doe.gov.my/v2/files/legislation/pua0139y1989.pdf* [Accessed 3 September 2009].

Government of Malaysia. *Environmental Quality (Sewage and Industrial Effluents) Regulations 1979).* Available from: http://www.doe.gov.my/v2/files/legislation/pua0012y1979.pdf [Accessed 3 September 2009].

Government of Malaysia. *Environmental Quality Act (1974)(Act 127).* Available from: http://www.doe.gov.my/v2/files/legislation/a0127.pdf . [Accessed 3 September 2009].

Government of Malaysia. *Solid Waste and Public Cleansing Waste Act 2007 (Act 627).* Available from http://www.kpkt.gov.my/kpkt_en/main.php?Content=sections&SectionID=73 [Accessed 7 September 2009].

Government of Malaysia. *Guidelines For The Classification of Used Electrical and Electronic Equipment in Malaysia.* Available from http://www.doe.gov.my/files/u1/ECTRICAL_AND_ELECTRONIC_EQUIPMENTIN_MALAYSIA.pdf [Accessed 3 September 2009].

Government of Malaysia. *List of full recovery facilities of e-waste in Malaysia.*. Available from: http://www.doe.gov.my/en/content/list-scheduled-waste-contractors-malaysia [Accessed 3 September 2010].

Government of Malaysia. *List of partial recovery facilities of e-waste in Malaysia.*. Available from: http://www.doe.gov.my/files/bahanberbahaya28/pdf/contractors/B2.pdf [Accessed 3 September 2010].

Government of Malaysia. *Malaysian Industrial Development Authority MIDA) website.* Available from: http://www.mida.gov [Accessed 3 December 2007].

Greenpeace, 2009. *Guide to Greener Electronics, Version 14, December*. Available from: http://www.greenpeace.org/raw/content/international/press/reports/guide-to-greener-electronics-14-edition.pdf. [Accessed 5 February 2010].

Gustavsson, E., Elander, I., and Lundmark, M., 2009. Multilevel Governance, Networking Cities and the Geography of Climate-change Mitigation: Two Swedish Examples. *Environment and Planning C: Government and Policy*, 27, pp. 59 – 74.

Hagelüken, C., 2008. Recycling of E-scrap in a Global Environment - Opportunities and Challenges. In Johri, R., ed. *E-waste. Implication,*

*Regulations, and* Management *in India and Current* Global *Best Practices.* New Delhi, India: TERI Press. pp.217-232.

Hall, N.L., and Taplin, R., 2006. *Influencing Climate Policy: The Effectiveness of Australian NGO Campaigns. Refereed Paper presented to the Australasian Political Studies Association Conference.* 25 – 27 September 2006. Australia: University of Newcastle.

Hassan, M.N., Rahman, R.A., Theng, L.C., Zakaria, Z., and Awang, M., 2000. Waste Recycling in Malaysia: Problems and Prospects. *Waste Management and Research.* 18, pp. 320 – 328.

Hezri, A.A. and Dovers,S.R., 2006, Sustainability indicators, policy and governance: Issues for ecological economics, *Ecological Economics*, 60,86 - 99

Hezri, A.A. and Hasan, M.N., 2006. Towards Sustainable Development? The Evolution of Environmental Policy in Malaysia, *Natural Resources Forum*, 30(2006). pp. 37-50.

Hilty, L.M., 2005. Electronic Waste – An Emerging Risk? *Environmental Impact Assessment Review*, 25, pp. 431 – 435.

Himley, M., 2008. Geographies of Environmental Governance: The Nexus of Nature and Neoliberalism, *Geography Compass*, 2, pp.1-19

Hischier, R., Wager, P., Gauglhofer, J., 2005. Does WEEE recycling make sense from an environmental perspective? The Environmental Impacts of the Swiss Take-back and Recycling System for Waste Electrical and Electronic Equipment (WEEE). *Environmental Impact Assessment Review,* 25, pp. 525 – 539.

Ho, P., 2001. Greening without Conflict? Environmentalism, NGOs and Civil Society. *Development and Change,* 32, pp. 893 – 921.

Hoffmann, J.E., 1992. Recovering Precious Metals From Electronic Scrap. *J-J Mines Met Mater Soc*, 44, pp. 43 – 48.

Hooghe, L., and Marks,G., 2003. Unraveling the Central State, but How? Types of Multi-level Governance. *American Political Science Review*. 97(2), pp. 233 – 243.

Horne, S., 2000. The Charity Shop: Purpose and Change. *International Journal of Nonprofit and Voluntary Sector Marketing,* 5 (2), pp. 113 – 124.

Hudson, B. and Hardy, B., 2002. What is 'successful' partnership and how can it be measured? In: Glendinning, C., Powell, M. and Rummery, K., eds., *Partnerships, new labour and the governance of welfare.* Bristol: The Policy Press

Huisman, J., and Magalini, F., 2007. Where are WEEE now? Lessons from WEEE: Will EPR Work for the US? *Proceedings of the 2007 IEEE International Symposium on Electronics and the Environment,* pp. 149 -154.

Hysing, E., 2009. Governing Wothout Government? The Private Governance of Forest Certification in Sweden. *Public Administration,* 87 (2), pp. 312 – 326.

Ibarahim, R., 2006. Waste Not Want Not. *IMPAK,Quarterly DOE Update on Environment, Development and Sustainability.* Issue 2/2006, pp 2.

Ikiara, M.M., Karanja, A.M., and Davies, T.C., 2004. Collection, transportation and disposal of urban solid waste in Nairobi. In: Baud, I., Post, J. and Furedy, C., eds., *Solid waste management and recycling: Actors, partnerships and policies in Hyderabad, India and Nairobi, Kenya.*Dordrecht: Kluwer Academic Publishers

INTERPOL Pollution Crime Working Group (Phase II) Report, 2009. *Electronic Waste and Organised Crime. Assessing the Links.* Available from: http://www.interpol.int/public/icpo/factsheets/wastereport.pdf. [Accessed 22 November 2010]

Jain, A., 2008. Global E-waste Growth. In Johri, R., ed. *E-waste. Implication, Regulations, and* Management *in India and Current* Global *Best Practices.* New Delhi, India: TERI Press. pp.3-22.

Janicke,M., and Weidner, H., 1997. Summary: Global Environmental Policy Learning. In Janicke,M., and Weidner, H., eds. *National Environmental Policies: A Comparative Study of Capacity Building.* Berlin: Springer.

Janz, A., and Bilitewski, B., 2008. Hazardous Substances in Waste Electrical and Electronic Equipment – Toxicity and Release. In Johri, R., ed. *E-waste. Implication, Regulations, and* Management *in India and Current* Global *Best Practices.* New Delhi, India: TERI Press. pp.91-120.

Jasanoff, S., 2004. Ordering knowledge, ordering society. In Jasanoff, S., ed. *States of Knowledge: The co-production of science and Social Order.* Abington: Routledge.

Jessop, B., 2004. The Political Economy of Scale and European Governance. *Tijdschrift voor Economische en Sociale Geografie,* 96(2), pp. 225 – 230.

Jessop, B., 2002. Globalization and the National State. In Aronowitz, S., and Bratsis, P., eds., Paradigm Lost: State Theory Reconsidered. Minneapolis, USA: University of Minnepolis Press.

Jessop, B., 1995. The Regulation Approach, Governance and Post-Fordism: Alternative Perspectives on Economic and Political Change. *Economy and Society*, 24, pp. 307 – 333.

Jessop, B., 1994. Post-Fordism and the State. In Amin, A., ed., *Post-Fordism: A Reader*.Oxford: Blackwell

Johri, R., and Basu, S., 2008. E-waste Generation, Mitigation, and A Case Study, Delhi. In Johri, R., ed. *E-waste. Implication, Regulations, and* Management *in India and Current* Global *Best Practices.* New Delhi, India: TERI Press. pp.45-68.

Jordan, A., 2008. The governance of sustainable development: taking stock and looking forwards. *Environment and Planning C: Government and Policy*, 26, pp. 17 – 33

Jordan, A., 2001. The European Union: An Evolving System of Governance…or Government?. *Policy and Politics*, 29 (2), pp. 193 – 208

Jordan, A. and Schout, A., 2005. Coordinated European Governance: Self Organising or Centrally-Steered?. *Public Administration.* 83(1), pp. 201 – 220.

Jordan, A., Wurzel, R. and Zito, A., 2005. The Rise of 'New' Policy Instrument in Comparative Perspective: Has Governance Eclipsed Government? *Political Studies, 53(4), pp. 477 – 496.*

Jordan, A., Wurzel, R. and Zito, A., 2003. 'New' Instruments of Environmental Governance: Patterns and Pathways of Change. In Jordan, A., Wurzel, R. and Zito, A., (eds). *'New' Instruments for Environmental Governance? National Experiences and Prospects*. London: Frank Cass.

Kalana, J.A., 2010. Electrical and Electronic Waste Management Practice by Households in Shah Alam, Selangor, Malaysia. *International Journal of Environmental Sciences*, 1(2), pp. 132 – 144.

Kang, H., and Schoenung, J.M., 2005. Electronic Waste Recycling: A Review of U.S. Infrastructure and Technology Options. *Resources Conservation and Recycling*, 45, pp. 368-400.

Karkkainen, B.C., 2004. Post-Sovereign Environmental Governance. *Global Environmental Politics*, 4(1), pp.72 – 96.

Khazanah Nasional Berhad website. Available from: http://www.khazanah.com.my/. [Accessed 15 June 2009].

Khetriwal, D.S., Kraeuchi, P. and Schwaninger, M., 2005. A comparison of electronic waste recycling in Switzerland and in India. *Environmental Impact Assessment Review,* 25, pp. 492 – 504.

Khetriwal, D.S., Kraeuchi, P. and Widmer, R., 2009. Producer responsibility for e-waste management: Key issues for consideration – Learning from the Swiss experience. *Journal of Environmental Management,* 90, pp. 153 – 165.

Khetriwal, D.S., Kuehr, R., and Huisman, J., 2008. One WEEE, Many Species: Lessons from the European Experience.*Proceedings of International Solid Waste Association (ISWA) World Congress,*3 – 5 November 2008. Singapore. Unpublished.

Khoo, S., Rau, H., 2009. Movements, Mobilities and the Politics of Hazardous Waste. *Environmental Politics,* 18 (6), pp. 960 – 980.

Kitchin, R. and Tate, N.J., 2000. *Conducting Research into Human Geography. Theory, Methodology and Practice.* Essex, England: Pearson Education Limited

Kjær, A.M., 2004. *Governance.* Cambridge UK: Polity Press

Klijn, E.H. and Teisman, G.R., 2003. Institutional and strategic barriers to public-private partnership: an analysis of Dutch case. *Public Money and Management,* 23, pp. 270- 273

Klooster, D., 2005. Environmental Certification of Forests: The Evolution of Environmental Governance in a Commodity Network. *Journal of Rural Studies,* 21(4), pp. 403 – 417.

Kocasoy, G., and Durmus, O., 2008. Management of Waste Electrical and Electronic Equipment and Related Legislation. *Proceedings of International Solid Waste Association (ISWA) World Congress,*3 – 5 November 2008. Singapore. Unpublished.

Kohler, A., and Erdmann, L., 2004. Expected Environmental Impacts of Pervasive Computing. *Ecological Risk Assessment,* 10, pp. 831 – 852.

Kooiman, J., 2003. *Governing as Governance.* London: Sage

Kooiman, J. and Jentoft, S., 2009. Meta-governance: Values, Norms and Principles, and the Making of Hard Choices. *Public Administration,* 87: 4, pp. 818 – 836.

Kouwenhoven, V.P., 1993. Public-Private Partnership. In Kooiman, J. (ed), *Modern Governance*. London: Sage.

Ladou, J. and Lovegrove, S., 2008. Export of Electronic Equipment Waste. *International Journal of Occupational and Environmental Health,* 14, pp. 1 – 10.

Lau, V.L., 2004. Case Study on the Management of Waste Materials in Malaysia. *Forum Geookol,* 15 (2), pp. 7 – 14.

Leach, R. and Percy-Smith, J., 2001. *Local Governance in Britain.* Basingstoke: Palgrave

Lee, H.K., 2006. Scheduled Waste Management: Issues and Challenges. *IMPAK,Quarterly DOE Update on Environment, Development and Sustainability*. Issue 2/2006, pp 4, 5 &15.

Lee, M., 2007. Our Electronic Waste is Piling Up Overseas. *Copley News Service,* 6 July.

Lepawsky, J. and Mc Nabb, C., 2010. Mapping International Flows of Electronic Waste. *The Canadian Geographer*, 54(2), pp. 177-195.

Lepsoe, S., 2006. Wasted Opportunities? NGOs in Waste Management Bridge the Social-Environmental Divide. Available from: http://www.casin.ch/web/pdf/ngospackaging.pdf.[Accessed 26 September 2009].

Levinson, T., Folman, C., and Lietzmann, J., 2008. E-waste Legislation in the European Union and the Basel Convention. In Johri,R., ed. *E-waste. Implication, Regulations, and Management in India and Current Global Best Practices.* New Delhi, India: TERI Press. pp. 151-168.

Levy, D.L., and Prakash, A., 2003. Bargains Old and New: Multinational Corporations in Global Governance. *Business and Politics*, 5 (August), pp. 131 – 150.

Li, J., Wen, X., Liu, T., Honda,S., 2004. Policies, Management, Technologies and Facilities for the Treatment of Electrical and Electronic Wastes in China. *The China-Netherlands Seminar on Recycling of Electronic Wastes.* Beijing [online]. Available at http//www.bcrc.cn/en/Backup/Meetings/China-Netherlands/10.pdf. [Accessed 16 January 2010].

Li, J.H., Gao, S., Duan, H.B, Liu, L.L., 2009. Recovery of valuable materials from waste liquid crystal display panel. *Waste Management.* 29, pp. 2033 – 2039.

Li, Y., Xu, X.J., Liu, J.X.,Wu, K.S., Gu, C.W., Shao, G., 2008. The Hazard of Chromium Exposure to Neonates in Guiyu of China. *Science Total Environment.* 403, pp. 99 – 104.

Li, Y., Richardson, J.B., Walker, A.K.,Youn, P.C., 2006. TCLP Heavy Metal Leaching of Personal Computer Components. *Journal of Environmental Engineering.* 132(4), pp. 497 – 504.

Lindhqvist, T., 2000. *Extended Producer Responsibility in Cleaner Production: Policy Principle to Promote Environmental Improvements of Product Systems*. Doctoral Dissertation, Lund University. Available from: http://www.lub.lu.se/luft/diss/tec355.pdf. [Accessed 30 November 2009]

Liu, X.B., Tanaka, M., Matsui, Y., 2006. Generational Amount Prediction and Material Flow Analysis of Electronic Waste: A Case Study in Beijing, China. *Waste Management and Resource,* 24, pp. 434 -445.

Ma, X., and Ortolano, L., 2000. *Environmental Regulations in China: Institutions, Enforcement and Compliance.* Lanham: Rowman and Littlefield.

MacLeod,G. and Goodwin,M., 1999. Space, Scale and State Strategy: Rethinking Urban and Regional Governance. *Progress in Human Geography,* 23(4), pp. 503- 527.

Malaysian Environmental NGO website. Available from www.**mengo**.org/. [Accessed 1 August 2009].

March, J.G., and Olsen, J.P., 1995. *Democratic Governance.* New York: The Free Press

Marshall, C. and Rossman, G.B., 1999. *Designing Qualitative Research. 3rd ed*. Thousand Oaks, California: Sage Publication, Inc.

Martello, M. and Jasanoff, S., 2004. Introduction: Globalization and Environmental Governance. In Martello,M. and Jasanoff,S., eds, *Earthly Politics.* Cambridge: MIT Press.

Martens, S., 2006. Public Participationn with Chinese Characteristics: Citizen Consumers in China's Environmental Management. *Environmental Politics,* 15 (2), pp. 211 – 230.

Mason, J., 2002. *Qualitative Researching. 2nd ed.* London: Sage Publication Ltd.

McCarthy, J., 2007. *Partnership, Collaborative Planning and Urban Regeneration.* Hampshire, England: Ashgate.

Miles, M.B. and Huberman, A.M., 1994. *Qualitative Data Analysis. An Expanded Sourcebook. 2nd ed.* Thousand Oaks, California: Sage Publication, Inc.

Mohan, M.P.R., Garg, I., and Kumar, G., 2008. Regulating e-waste: a review of the international and national legal framework on e-waste. In Johri, R., ed. *E-waste. Implication, Regulations, and* Management *in India and Current* Global *Best Practices.* New Delhi, India: TERI Press. pp.169-188.

Morse, S. and McNamara, N., 2008. Creating a greater partnership: analyzing partnership in the Catholic Church development chain. *Area*, 40 (1), pp. 65 – 78.

Motorola website. Available from: www.motorola.com. [Accessed 15 July 2009].

Murdoch, J., 1997. The Shifting Territory of Government: Some Insights from the Rural White Paper. *Area*, 29, pp. 109 – 118.

Murdoch, J., and Abram, S., 1998. Defining the Limits of Community Governance. *Journal of Rural Studies*, 14(1), pp. 41 – 50.

Newman, J., 2001. *Modernising Governance. New Labour, Policy and Society*. London: Sage.

Nixon, H., and Saphores, J.M., 2009. Information and the decision to Recycle: Results from a Survey of US Households. *Environmental Planning and Management*, 52(2), pp. 257 – 277.

Nnorom, I.C. and Osibanjo,O., 2008. Electronic waste (e-waste): Material flows and management practices in Nigeria. *Waste Management*, 28: 1472 – 1479

Nokia website. Available from: www.nokia.com.my/nokiakiosk. [Accessed 15 July 2009].

OECD, 2001. *Extended Producer Responsibility: A Guidance Manual for Governments*. Paris, France: Organisation for Economic Cooperation and Development.

OECD, 2006. *EPR Policies and Product Design: Economic Theory and Selected Case Studies.*. Paris, France: Organisation for Economic Cooperation and Development.

OECD, 2008. *Environmental Outlook to 2030.* Organisation for Economic Cooperation and Development [online]. Available from: http://213.253.134.43/oecd/pdfs/browseit/9708011E.PDF. [Accessed 1 June 2009].

Osborne, S.P., 2000. *Public-private partnerships: Theory and practice in international perspective*. London: Routledge.

Othman, N., Basri, N.E.A., Yunus, M.N.M., Ahmad, A., and Pauzi, N.I.M., 2004. A Study on E-waste Management in Malaysia. *Proceedings of 2nd Bangi World Conference on Environmental Management: Facing Changing Conditions.*

Pasang, H., Moore, G.A., Sitorus, G., 2007. Neighbourhood-based Waste Management: A Solution for Solid Waste Problems in Jakarta, Indonesia. *Waste Management.*27 (12), pp. 1924 – 1938

Peters, G., 2000. Governance and Comparative Politics. In Pierre, J., ed., *Debating Governance: Authority, Steering and Democracy.* Oxford: Oxford University Press.

PEWOG website. Available from: http:// pewog.org [Accessed 4 February 2009]

Philliber, S.G., Schwab, M.R., and Samsloss, G., 1980. *Social Research: Guides to a Decision-making Process*. Itasca, Illinois: Peacock.

Pierre, J., 2000. Conclusions: Governance Beyond State Strength. In Pierre, J., ed., *Debating Governance: Authority, Steering and Democracy.* Oxford: Oxford University Press.

Pierre, J. and Peters, B.G., 2000. *Governance, Politics and the State*. London: Macmillan Press

Pinto, J., 2005. The Serious Problems with E-waste. *InTech,* 20 April 2005. Available from: http://www.isa.org.content/contentGroups/News. [Accessed 21 August 2010].

Potter, D., and Taylor, A., 1996. Introduction. In Potter, D., (ed). *NGOs and Environmetal Policies. Asia and Africa.* London: Frank Cass and Company Limited.

Puckett, J., 2005. *The Digital Dump: Exporting Re-use and Abuse to Africa.* Seattle: Basel Action Network

Puckett, J.,Byster, L., Westervelt, S., Gutierrez, R., Davis, S., Hussein, A., Dutta, M., 2002. *Exporting Harm: The High-tech Trashing of Asia.* Seattle: The Basel Action Network and Silicon Valley Toxic Coalition. Available from: http://ban.org/E-waste/technotrashfinalcomp.pdf . [Accessed 1 June 2008].

Putnam, R.D., 2000. *Bowling Alone: The Collapse and Revival of American Community.* New York: Simon & Schuster.

Qing, D., and Vermeer, E., 1999. Do Good Work, but do not Offend the 'Old Communists', in Draguhn, W., and Ash. R., (eds). *China's Economic Security.* Richmond, VA: Curzon Press, pp. 142 – 162.

Ray, A., 2008. Waste Management in Developing Asia: Can Trade and Cooperation Help?. *The Journal of Environment and Development,* 17(3), pp. 3 – 25.

Rekacewicz, P., 2002. UNEP/GRID-Arendal**.** Available from: http://maps.grida.no/go/graphic/who-gets-the-trash. [Accessed 19 January 2010].

Rekacewicz, P., 2004. UNEP/GRID-Arendal. Available from: http://maps.grida.no/go/graphic/personal-computers-per-1000-people**.** **[**Accessed 19 January 2010].

Renckens, S., 2008. Yes, We Will! Voluntarism in US E-Waste Governance. *RECEIL.* 3, pp. 286 – 299.

Rhodes, R.A.W., 1997. *Understanding Governance: Policy Networks, Governance, Reflexivity and Accountability.* Bristol: Open University Press.

Riessman, C.K., 1993. *Narrative Analysis.* Thousand Oaks, California: Sage Publication, Inc.

Riley, M., 2008. From Salvage to Recycling – New Agendas or Same Old Rubbish? *Area,* 40(1), pp. 79 – 89.

Roberts, I., 2000. Leicester Environment City: Learning How to Make Local Agenda 21, Partnerships and Participation Deliver. *Environment and Urbanisation,* 12, pp. 9 – 27.

Robinson, B.H., 2009. E-waste: An Assessment of Global Production and Environmental Impacts. *Science of the Total Environment.* 408, pp. 183 – 191.

Rochat, D., Rodrigues, W., Gantenbein, A., 2008. India: Including the Existing Informal Sector in a Clean E-waste Channel. In *Waste Management Conference (Wastecon2008).* Durban, South Africa [online]. Available from: http://ewasteguide.info/system/files/Rochat_2008_WasteCon.pdf. [Accessed 17 January 2010].

Ronit, K. and Schneider, V., 1999. Global Governance through Private Organisations. *Governance: An International Journal of Policy and Administration,* 12(3), pp. 243 – 266.

Rosenau, J.N. and Durfee, M., 1999. *Thinking Theory Thoroughly: Coherent Approaches to an Incoherent World.* Colarado: Westview Press.

Rosenau, J., 1992. Governance, Order and Change in World Politics. In Rosenau, J. and Czempiel, E-O., (eds), *Governance Without Government.* Cambridge: Cambridge University Press.

Saich, T., 2000. Negotiating the State: The Development of Social Obligations in China. *China Quarterly,* 161, pp. 125 – 141.

Sandler, T., 2004. *Global Collective Action.* Cambridge: Cambridge University Press.

Sanwal, M., 2007. Evolution of Global Environmental Governance and the United Nations. *Global Environmental Politics,*7(3), pp.1-12.

Sarkar, A., 2008. Occupational and Environmental Health Perspectives of E-waste Recycling in India: A Review. In Johri, R., ed. *E-waste. Implication, Regulations, and* Management *in India and Current* Global *Best Practices.* New Delhi, India: TERI Press. pp.169-188.

Savas, E.S., 2000. *Privatisation and Public-Private Partnerships.* New York: Seven Bridges Press

Schleup, M., Hagelueken, C., Kuehr, R., Magalini, F., Maurer, C., Meskers, C., Mueller, E., and Wang, F., 2009. *Recycling – From E-waste to Resources,* Final Report, July 2009. Available from: http://www.unep.org/PDF/PressReleases/E_waste-_publication_screen_FINALVERSION-sml-pdf. [Accessed 9 March 2011].

Schmidt, C.W., 2006. Unfair Trade- E-waste in Africa. *Environmental Health Perspective,* 114:A, pp. 232 – 235.

Schout, A., Jordan, A., and Twena, M., 2010. From 'Old' to 'New' Governance in the EU: Explaining the Diagnostic Deficit. *West European Politics,* 33 (1), pp. 154 – 170.

Schwartz, J., 2004. Environmental NGOs in China: Roles and Limits. *Pacific Affairs.* 77:1, pp. 28 – 49

Scott, C., 2009. Governing Without Law or Governing Without Government? New-ish Governance and Legitimacy of the EU. *European Law Journal,* 15 (2), pp. 160 – 173.

Segosebe, E.M., 2000. Waste Management: The Role of Non-governmental Organisations (NGOs). In Okot-Uma, R.W.O., Ekosse, G.E., Bogatsu, Y.G., Darkoh, K., and Totolo, O., (eds), *Pollution Control and Waste Management in Developing Countries.* London: Commonwealth Secretariat.

Seidman, G.W., 2007. *Beyond the Boycott: Labor Rights, Human Rights, and Transnational Activism.* New York: Russell Sage Foundation.

Shi, H. and Zhang, L., 2006. China's Environmental Governance of Rapid Industrialisation. *Environmental Politics,* 15(2), pp. 271 – 292.

Silicon Valley Toxics Coalition website. Available from: http://www. svtc.org. [Accessed 12 September 2010]

Sinha, S., 2008. Dark Shadows of Digitization on Indian Horizon. In Johri, R., ed. *E-waste. Implication, Regulations, and* Management *in India and Current* Global *Best Practices.* New Delhi, India: TERI Press. pp.169-188.

Sinha-Khetriwal, D.S., Kraeuchi, P. and Schwaninger, M., 2005. A Comparison of Electronic Waste Recycling in Switzerland and in India. *Environmental Impact Assessment Review,* 25, pp. 492 – 504.

Slater, R., Frederickson, J., Thomas, C., Wield, D. and Potter, S., 2007. A Critical Evaluation of Partnerships in Municipal Waste Management in England. *Resources Conservation & Recycling.* 51, pp. 643 – 664

Sminsmans, S., 2006. New Modes of Governance and the Participatory Myth. *In European Governance Papers.* Available from: http://www.connex-network.org/eurogov/pdf/egp-newgov-N-06-01.pdf. [Accessed 18 August 2010].

Smith, K., 2007. *The Carbon Neutral Myth: Offset Indulgences for Your Carbon Sins.* Amsterdam: Transnational Institute.

Socio-Economic and Environment Research Institute (SERI) website. Available from: http://www.seri.com.my. [Accessed 1 September 2009].

Solving The E-waste Problem (StEP) website. Available from: http:// www.step-initiative.org. [Accessed 30 June 2008].

Sonnenfeld, D.A., and Mol, A.P.J., 2006. Environmental Reform in Asia: Comparisons, Challenges, Next Steps. *The Journal of Environment and Development,* 15 (112), pp. 112 – 137.

Sørensen, E. and Torfing, J., 2009. Making Governance Network Effective and Democratic through Metagovernance. *Public Administration,* 87 (2), pp. 234 – 258.

Sørensen, E., 2006. Metagovernance. The Changing Role of Politicians in Processes of Democratic Governance. *American Review of Public Administration,* 36 (1), pp. 98 – 114.

Spar, D., and La Mure, L.T, 2003. The Power of Activitism: Assessing the Impact of NGOs on Global Business. *California Management Review,* 45(3), pp. 78 – 101.

Steffek, J. and Sminsmans, S., 2008. Civil Society Participation in European Governance. In *NewGov. New Modes of Governance Project Report.*

Steubing, B., Böni, H., Schluep, M., Silva, U., Ludwig, C., 2010. Assessing Computer Waste Generation in Chile Using Material Flow Analysis. *Waste Management.* 30, pp. 473 – 482.

Stoker, G. and Young, S., 1993. *Cities in the 1990s.* Essex, England: Longman

Stoker, G., 1998. Governance as theory: five propositions. *International Social Science Journal,* 155, 17-28

Stoker, G., 2000. Urban Political Science and the Challenge of the Urban Governance. In Pierre, J., ed., *Debating Governance: Authority, Steering and Democracy.* Oxford: Oxford University Press.

Strømsnes, K., Selle, P., Grenstad, G., 2009. Environmentalism between State and Local Community: Why Greenpeace has failed in Norway. *Environmental Politics,* 18(3), pp. 391 – 407.

Streicher-Porte, M., Widmer, R., Jain, A., Bader, H., Scheidegger, R., and Kytzia, S., 2005. Key drivers of the e-waste recycling system: Assessing and modeling e-waste processing in the informal sector in Delhi. *Environmental Impact Assessment Review,* 25, pp. 472 – 491.

Taket, A. and White, L., 2000. *Partnership and Participation. Decision-making in the Multiagency Setting.* Sussex, England: John Wiley & Sons

Tchobanoglous, G., Theisen, H., and Vigil, S.A., 1993. *Integrated Solid Waste Management. Engineering Principles and Management Issues. International Edition.* Singapore: McGraw-Hill.

Terazono, A. et al., 2006. Current Status and Research on E-waste Issues in Asia. *Environmental Engineering Science*. 8, pp. 1-12.

The New Straits Times, 13 July 2009, *Toxic E-waste*.

The Star, 1 April 2009, *Fully Digital TV Age*.

The World Bank Website. Available from: http://web.worldbank.org. [Accessed 15 August 2010].

The World Bank, 2005. *Urban Solid Waste Management*. Washington: The World Bank.

Theng, L.C., 2006. Waste to Wealth. How it Works in Malaysia. *IMPAK,Quarterly DOE*

Thornley, A., 1993. *Urban Planning under Thatcherism: The Challenges of the Market,* 2nd ed. London: Routledge.

Trubek, D, M. and Trubek, L.G., 2005. The Coexistence of New Governance and Legal Regulation: Complementarity or Rivalry? *Paper Presented at the Annual Meeting of the Research Committee on the Sociology of Law, Paris, July 2005.*

Trumpy, A.J., 2008. Subject to Negotiation: The Mechanisms Behind Co-optation and Corporate Reform. *Social Problems,* 55 (4), pp. 480 – 500.

Tuckett, A.G., 2005. Applying Thematic Analysis Theory to Practice: A Researcher's Experience. *Contemporary Nurse,* 19, pp. 75 – 87.

UK Environmental Agency Website. Available from: http:www.environment-agency.gov.uk. [Accessed 21 July 2010].

UNEP, 2006. *Call for Global Action on E-waste.* United Nations Environmental Programme.

UNEP, 2007. *E-Waste Management.* United Nations Environmental Programme. Available from: http://www.unep.fr/pc/pc/waste/e-waste_fag.htm. [Accessed 15 December 2008].

UNEP, 2010. *Urgent Need to Prepare Developing Countries for Surge in E-wastes. Rocketing Sales of Cell Phones, Gadgets, Appliances in China, India, elsewhere Forecast.* Available from: http://www.unep.org/Documents.Multilingual/Default.Print.asp?DocumentID=612&ArticleID=6471. [Accessed 9 March 2011]

United Nations University, 2008. *Study Report on the Review of the WEEE Directive.*. Available from: http://ec.europa.eu/environment/waste/weee/pdf/final_rep_unu.pdf. [Accessed 22 February 2010].

United States of America Environmental Protection Program website. Available from: http://www.epa.gov/ecycling/docs/factl1-07.pdf. [Accessed 4 January 2009].

van Kersbergen, K. and van Waarden, F., 2004. Governance as a Bridge between Disiplines. *European Journal of Political Research.* 43(2), pp. 143 – 171.

van Waarden, F., 1992. Dimensions and Types of Policy Networks. *European Journal of Political Research,* 21, pp. 29 – 52.

Visvanathan, C., and Norbu, T., 2006. Promoting the 3R in South Asia: Issues and Possible Solutions. *Synthesis Report of 3R South Asia Expert Workshop.* Available from: http: // scholar.google.co.uk. [Accessed 21 October 2009].

Vogel, D., 2005. *The Market for Virtue: The Potential and Limits of Corporate Social Responsibility.* Washington D.C: Brookings Institution Press.

Waddock, S.A., and Bannister, B.D., 1991. Correlates of Effectiveness and Partner Satisfaction in Social Partnerships. *Journal of Organisational Change Management.* 4(2), pp. 64 – 79.

Wagner, T.P., 2009. Shared responsibility for managing electronic waste: A Case Study of Maine, USA. *Waste Management.* 29, pp. 3014 – 3021.

Walls, M., 2006. *Extended Producer Responsibility and Product design, Economic Theory and Selected Case Studies.* Washington: Resources for the Future.

White, G., 1994. Civil Society, Democratization and Development (I): Clearing the Analytical Ground. *Democratization.* 1:3, pp. 375 – 390

Widmer, R., Oswald-Krapf, H., Sinha-Khetriwal, D., Schnellmann, M., Boni, H., 2005. Global Perspective on E-waste. *Environmental Impact Assessment Review*. 25, pp. 436 – 458.

Widmer, R., Schluep, M. and Denzler, S., 2008. *The Swiss Global E-waste Programme*. *Proceedings of the19th Waste Management Conference of the IWMSA.* 6-10th October 2008. Durban, South Africa.

Williams, P., 2005. *Waste Treatment and Disposal.* Chichester: Wiley.

Wood, D. and Schneider, R., 2006. ToxicDude.com: The Dell Campaign. In Smith, T., Sonnenfeld, D.A., and Pellow, D.N., (eds), *Challenging the Chip: Labour Rights and Environmental Justice in the Global Electronics Industry.* Philadelphia: Temple University Press.

Wolcott, H.F., 1994. *Transforming Qualitative Data: Description, Analysis and Interpretation.* Thousand Oaks, California: Sage Publication, Inc.

Wong, C.S.C., Duzgoren-Aydin N.S., Aydin, A., and Wong, M.H., 2007. Evidence of excessive releases of Metals from Primitive E-waste Processing in Guiyu, China. *Environmental Pollution,* 148, pp.62 -72.

Yang, W., 2008. Regulating Electrical and Electronic Wastes in China. *RECIEL*. 17(3), pp. 337 – 346.

Yin, R.K., 2003. *Case Study Research. Design and Methods*. Thousand Oaks, California: Sage Publication, Inc.

Yla-Mella,Y., Pongracz, E., Keiski, R.L., 2004. Recovery of Waste Electrical and Electronic Equipment (WEEE) in Finland. In: Pongracz, E (ed.), *Proceedings of the Waste Minimisation and Resource Use Optimization Conference*, June 10, 2004, Oulu, Finland, pp. 83 – 92. Available from: http://www.oulu.fi/resopt/wasmin/ylamella.pdf. [Accessed 15 December 2009].

Zhang, L., 2009. From Guiyu to a Nationwide Policy: E-waste Management in China. *Environmental Politics,* 18 (6), pp. 981 – 987.